



# Service Manual

## KP210/KP215



Model : KP210/KP215



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# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

## 1.2 Regulatory Information

### A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it.

The manufacturer will not be responsible for any charges that result from such unauthorized use.

### B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent.

The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

# 1. INTRODUCTION

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## E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

## G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

## H. Electrostatic Sensitive Devices

### ATTENTION

**Boards, which contain Electrostatic Sensitive Device (ESD), are indicated  by the sign.**

**Following information is ESD handling:**

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static matb which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

### 1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

|        |   |
|--------|---|
| APC    | Automatic Power Control                           |
| BB     | Baseband  |
| BER    | Bit Error Ratio                                   |
| CC-CV  | Constant Current – Constant Voltage               |
| DAC    | Digital to Analog Converter                       |
| DCS    | Digital Communication System                      |
| dBm    | dB relative to 1 milli watt                       |
| DSP    | Digital Signal Processing                         |
| EEPROM | Electrical Erasable Programmable Read-Only Memory |
| ESD    | Electrostatic Discharge                           |
| FPCB   | Flexible Printed Circuit Board                    |
| GMSK   | Gaussian Minimum Shift Keying                     |
| GPIO   | General Purpose Interface Bus                     |
| GSM    | Global System for Mobile Communications           |
| IPUI   | International Portable User Identity              |
| IF     | Intermediate Frequency                            |
| LCD    | Liquid Crystal Display                            |
| LDO    | Low Drop Output                                   |
| LED    | Light Emitting Diode                              |
| OPLL   | Offset Phase Locked Loop                          |

# 1. INTRODUCTION

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|        |  |
|--------|--|
| PAM    | Power Amplifier Module                                     |
| PCB    | Printed Circuit Board                                      |
| PGA    | Programmable Gain Amplifier                                |
| PLL    | Phase Locked Loop  |
| PSTN   | Public Switched Telephone Network                          |
| RF     | Radio Frequency  |
| RLR    | Receiving Loudness Rating                                  |
| RMS    | Root Mean Square   |
| RTC    | Real Time Clock  |
| SAW    | Surface Acoustic Wave                                      |
| SIM    | Subscriber Identity Module                                 |
| SLR    | Sending Loudness Rating                                    |
| SRAM   | Static Random Access Memory                                |
| PSRAM  | Pseudo SRAM  |
| STMR   | Side Tone Masking Rating                                   |
| TA     | Travel Adapter   |
| TDD    | Time Division Duplex                                       |
| TDMA   | Time Division Multiple Access                              |
| UART   | Universal Asynchronous Receiver/Transmitter                |
| VCO    | Voltage Controlled Oscillator                              |
| VCTCXO | Voltage Control Temperature Compensated Crystal Oscillator |
| WAP    | Wireless Application Protocol                              |

## 2. PERFORMANCE

### 2.1 H/W Features

| Item               | Feature  | Comment |
|--------------------|--|---------|
| Standard Battery   | Li-ion, 3.7V 800mAh  |         |
| Talk time          | Up to 180min: GSM Tx Level 7   |         |
| Stand by time      | Up to 250 hours (Paging Period: 5, RSSI: -85 dBm)  |         |
| Charging time      | Approx. 2.5 hours  |         |
| RX Sensitivity     | -102dBm  |         |
| TX output power    | GSM850, GSM900: 32.5dBm(Level 5),<br>DCS, PCS: 29.5dBm(Level 0)  |         |
| GPRS compatibility | Class 10   |         |
| SIM card type      | 3V Small   |         |
| Display            | MAIN: TFT 128 × 160 pixel 262K Color<br>SUB: CSTN 96 × 64 pixel 65K Color  |         |
| Status Indicator   | Hard icons. Key Pad<br>0 ~ 9, #, *, Up/Down/Left/Right/Ok Navigation Key<br>Menu Key, Clear Key, Back Key, Confirm Key<br>Send Key, Volume Key, PWR Key, Camera Key, Hot Key |         |
| ANT                | Internal   |         |
| EAR Phone Jack     | Yes (Stereo)   |         |
| PC Synchronization | Yes  |         |
| Speech coding      | EFR/FR/HR  |         |
| Data               | Yes  |         |
| Vibrator           | Yes  |         |
| Loud Speaker       | Yes  |         |
| Voice Recoding     | Yes  |         |
| Microphone         | Yes  |         |
| Speaker/Receiver   | One way speaker  |         |
| Travel Adapter     | Yes  |         |
| MIDI               | SW MIDI  |         |
| Camera             | VGA  |         |



## 2. PERFORMANCE

### 2.2 Technical Specification(KP210a)

| Item | Description                 | Specification   |        |        |       |        |        |
|------|-----------------------------|---|--------|--------|-------|--------|--------|
| 1    | Frequency Band              | <b>GSM850</b> <ul style="list-style-type: none"><li>• TX: 824 + 0.2 x (n-127) MHz</li><li>• RX: 869 + 0.2 x (n-127) MHz ( n = 128 ~ 251)</li></ul> <b>PCS1900</b> <ul style="list-style-type: none"><li>• TX: 1850 + ( n-511) x 0.2 MHz</li><li>• RX: 1930 + ( n-511) x 0.2 MHz (n = 512 ~ 810)</li></ul> |        |        |       |        |        |
| 2    | Phase Error                 | RMS < 5 degrees<br>Peak < 20 degrees  |        |        |       |        |        |
| 3    | Frequency Error             | < 0.1ppm  |        |        |       |        |        |
| 4    | Power Level                 | <b>GSM850</b>   |        |        |       |        |        |
|      |                             | Level   | Power  | Toler. | Level | Power  | Toler. |
|      |                             | 5   | 33 dBm | ±2dB   | 13    | 17 dBm | ±3dB   |
|      |                             | 6   | 31 dBm | ±3dB   | 14    | 15 dBm | ±3dB   |
|      |                             | 7   | 29 dBm | ±3dB   | 15    | 13 dBm | ±3dB   |
|      |                             | 8   | 27 dBm | ±3dB   | 16    | 11 dBm | ±5dB   |
|      |                             | 9   | 25 dBm | ±3dB   | 17    | 9 dBm  | ±5dB   |
|      |                             | 10  | 23 dBm | ±3dB   | 18    | 7 dBm  | ±5dB   |
|      |                             | 11  | 21 dBm | ±3dB   | 19    | 5 dBm  | ±5dB   |
|      |                             | 12  | 19 dBm | ±3dB   |       |        |        |
|      |                             | <b>PCS</b>  |        |        |       |        |        |
|      |                             | Level   | Power  | Toler. | Level | Power  | Toler. |
|      |                             | 0   | 30 dBm | ±2dB   | 8     | 14 dBm | ±3dB   |
|      |                             | 1   | 28 dBm | ±3dB   | 9     | 12 dBm | ±4dB   |
|      |                             | 2   | 26 dBm | ±3dB   | 10    | 10 dBm | ±4dB   |
|      |                             | 3   | 24 dBm | ±3dB   | 11    | 8 dBm  | ±4dB   |
|      |                             | 4   | 22 dBm | ±3dB   | 12    | 6 dBm  | ±4dB   |
|      |                             | 5   | 20 dBm | ±3dB   | 13    | 4 dBm  | ±4dB   |
|      |                             | 6   | 18 dBm | ±3dB   | 14    | 2 dBm  | ±5dB   |
| 7    | 16 dBm                      | ±3dB  | 15     | 0 dBm  | ±5dB  |        |        |
| 5    | EDGE<br>Max. Power          | Not support   |        |        |       |        |        |
| 6    | EDGE<br>Modulation Accuracy | Not support   |        |        |       |        |        |

## 2. PERFORMANCE

| Item | Description                               | Specification              |            |
|------|---|----------------------------|------------|
| 7    | Output RF Spectrum<br>(Due to Modulation) | <b>GSM850</b>              |            |
|      |   | Offset from Carrier (kHz). | Max. [dBc] |
|      |   | 100                        | 0.5        |
|      |   | 200                        | -30        |
|      |   | 250                        | -33        |
|      |   | 400                        | -60        |
|      |   | 600 ~ 1,200                | -60        |
|      |   | 1,200 ~ 1,800              | -60        |
|      |   | 1,800 ~ 3,000              | -63        |
|      |   | 3,000 ~ 6,000              | -65        |
|      |   | 6,000                      | -71        |
|      |   | <b>PCS</b>                 |            |
|      |   | Offset from Carrier (kHz). | Max. [dBc] |
|      |   | 100                        | 0.5        |
|      |   | 200                        | -30        |
|      |   | 250                        | -33        |
|      |   | 400                        | -60        |
|      |   | 600 ~ 1,200                | -60        |
|      |   | 1,200 ~ 1,800              | -60        |
|      |   | 1,800 ~ 3,000              | -65        |
|      |   | 3,000 ~ 6,000              | -65        |
|      |   | 6,000                      | -73        |
| 8    | Output RF Spectrum<br>(Due to Switching)  | <b>GSM850</b>              |            |
|      |   | Offset from Carrier (kHz)  | Max. [dBm] |
|      |   | 400                        | -19        |
|      |   | 600                        | -21        |
|      |   | 1,200                      | -21        |
|      |   | 1,800                      | -24        |

## 2. PERFORMANCE

| Item | Description                              | Specification                                     |          |            |
|------|--|---|----------|------------|
| 8    | Output RF Spectrum<br>(Due to Switching) | <b>PCS</b>  |          |            |
|      |  | Offset from Carrier (kHz)                         |          | Max. [dBm] |
|      |  | 400   |          | -22        |
|      |  | 600   |          | -24        |
|      |  | 1,200   |          | -24        |
|      |  | 1,800   |          | -27        |
| 9    | Spurious Emissions                       | Conduction, Emission Status                       |          |            |
|      |  | Radiation, Emission Status                        |          |            |
| 10   | Bit Error Ratio                          | <b>GSM850</b><br>BER (Class II) < 2.439% @-102dBm |          |            |
|      |  | <b>PCS</b><br>BER (Class II) < 2.439% @-102dBm    |          |            |
| 11   | Rx Level Report accuracy                 | $\pm 3$ dB  |          |            |
| 12   | SLR                                      | $8 \pm 3$ dB                                      |          |            |
| 13   | Sending Response                         | Frequency (Hz)                                    | Max.(dB) | Min.(dB)   |
|      |  | 100   | -12      | -          |
|      |  | 200   | 0        | -          |
|      |  | 300   | 0        | -12        |
|      |  | 1,000   | 0        | -6         |
|      |  | 2,000   | 4        | -6         |
|      |  | 3,000   | 4        | -6         |
|      |  | 3,400   | 4        | -9         |
|      |  | 4,000   | 0        | -          |
| 14   | RLR(Normal volume)                       | $-4 \pm 3$ dB                                     |          |            |
| 15   | Receiving Response<br>(Type 3.2)         | Frequency (Hz)                                    | Max.(dB) | Min.(dB)   |
|      |  | 100   | -6       | -          |
|      |  | 200   | 2        | -          |
|      |  | 300   | 2        | -9         |
|      |  | 1,000   | 2        | -7         |
|      |  | 3,400   | 2        | -12        |
|      |  | 4,000   | 2        | -          |

## 2. PERFORMANCE

| Item | Description          | Specification   |
|------|----------------------|---|
| 16   | STMR                 | > 17 dB   |
| 17   | Echo Loss            | > 40 dB   |
| 18   | Idle Noise Sending   | < -64 dBm0p   |
| 19   | Idle Noise Receiving | < -36 dBm0p   |
| 20   | Power consumption    | Max. power<br>< 330mA @GSM850, PL=5<br>< 250mA @PCS, PL=0   |
|      |                      | Standby<br>< 5.5mA @PP2<br>< 3.3mA @PP5<br>< 2.7mA @PP9   |
|      |                      | Bluetooth<br>(not support)  |
|      |                      | FM radio<br>(not support)   |
|      |                      | Backup Battery(Without Main Battery)<br>Normal Power Off: < 5uA<br>Emergency Power Off: < 15uA  |
| 21   | Talk Time            | 2.2 hr., Min.@GSM850, PL=5<br>4.0 hr., Min.@GSM850, PL=12<br>3.0 hr., Min.@PCS, PL=0<br>5.0 hr., Min.@PCS, PL=10  |
| 22   | Standby Time         | 270 hr., Min.@PP9<br>220 hr., Min.@PP5  |
|      |                      | - Full charge, no receive/send and keep GSM in idle mode<br>Broadcast set off. Signal strength display set at 3 levelabove. Backlight of phone set off. |
| 23   | Ringer Volume(TBD)   | At least 55 dB under below conditions:  |
|      |                      | 1. Ringer set as ringer.  |
|      |                      | 2. Test distance set as 1 m.  |
| 24   | Charge Current       | Fast Charge: < 500 mA<br>Slow Charge: < 120 mA  |
| 25   | Charging Time        | Under 3 hr.   |

## 2. PERFORMANCE

| Item | Description              | Specification   |                     |
|------|--------------------------|---|---------------------|
| 26   | Antenna Display          | Antenna Bar Number  | Power               |
|      |                          | 5   | -92 dBm ~           |
|      |                          | 4   | -100 dBm ~ -93 dBm  |
|      |                          | 3   | skip                |
|      |                          | 2   | -103 dBm ~ -101 dBm |
|      |                          | 1   | -105 dBm ~ -104 dBm |
|      |                          | 0   | ~ -105 dBm          |
| 27   | Battery Indicator(TBD)   | Battery Bar Number  | Voltage             |
|      |                          | 1 → 0   | 3.54V ± 0.05V       |
|      |                          | 2 → 1   | 3.64V ± 0.05 V      |
|      |                          | 3 → 2   | 3.75V ± 0.05 V      |
|      |                          | 3   | 4.2V                |
| 28   | Low Voltage Warning(TBD) | 3.54 ± 0.05 V (Call)  |                     |
|      |                          | 3.40 ± 0.05 V (Standby)   |                     |
| 29   | Forced shut down Voltage | 3.33 ± 0.05V  |                     |
| 30   | Battery Type             | Main Battery: Li-ion, 800mAh, Hard pack<br>Back-up Battery: Lithium, 1mAh |                     |
| 31   | Travel Charger           | Input: 100 ~ 240 V, 50/60Hz<br>Output: 4.8V, 900mA                        |                     |

### 2.3 Technical Specification (KP215b)

| Item | Description                 | Specification   |        |        |       |        |        |
|------|-----------------------------|---|--------|--------|-------|--------|--------|
| 1    | Frequency Band              | <b>GSM900</b><br>1) PGSM<br>• TX: 890 + 0.2 x n MHz<br>• RX: 935 + 0.2 x n MHz (n = 1 ~ 124)<br>2) EGSM<br>• TX: 890 + 0.2 x (n-1024) MHz<br>• RX: 935 + 0.2 x (n-1024) MHz n = 975 ~ 1023)<br><b>DCS1800</b><br>• TX: 1710.2 + 0.2 x (n-512) MHz<br>• RX: 1805.2 + 0.2 x (n-512) MHz (n = 512 ~ 885) |        |        |       |        |        |
| 2    | Phase Error                 | RMS < 5 degrees<br>Peak < 20 degrees  |        |        |       |        |        |
| 3    | Frequency Error             | < 0.1ppm  |        |        |       |        |        |
| 4    | Power Level                 | <b>GSM900</b>   |        |        |       |        |        |
|      |                             | Level   | Power  | Toler. | Level | Power  | Toler. |
|      |                             | 5   | 33 dBm | ±2dB   | 13    | 17 dBm | ±3dB   |
|      |                             | 6   | 31 dBm | ±3dB   | 14    | 15 dBm | ±3dB   |
|      |                             | 7   | 29 dBm | ±3dB   | 15    | 13 dBm | ±3dB   |
|      |                             | 8   | 27 dBm | ±3dB   | 16    | 11 dBm | ±5dB   |
|      |                             | 9   | 25 dBm | ±3dB   | 17    | 9 dBm  | ±5dB   |
|      |                             | 10  | 23 dBm | ±3dB   | 18    | 7 dBm  | ±5dB   |
|      |                             | 11  | 21 dBm | ±3dB   | 19    | 5 dBm  | ±5dB   |
|      |                             | 12  | 19 dBm | ±3dB   |       |        |        |
|      |                             | <b>DCS1800</b>  |        |        |       |        |        |
|      |                             | Level   | Power  | Toler. | Level | Power  | Toler. |
|      |                             | 0   | 30 dBm | ±2dB   | 8     | 14 dBm | ±3dB   |
|      |                             | 1   | 28 dBm | ±3dB   | 9     | 12 dBm | ±4dB   |
|      |                             | 2   | 26 dBm | ±3dB   | 10    | 10 dBm | ±4dB   |
|      |                             | 3   | 24 dBm | ±3dB   | 11    | 8 dBm  | ±4dB   |
|      |                             | 4   | 22 dBm | ±3dB   | 12    | 6 dBm  | ±4dB   |
|      |                             | 5   | 20 dBm | ±3dB   | 13    | 4 dBm  | ±4dB   |
|      |                             | 6   | 18 dBm | ±3dB   | 14    | 2 dBm  | ±5dB   |
| 7    | 16 dBm                      | ±3dB  | 15     | 0 dBm  | ±5dB  |        |        |
| 5    | EDGE<br>Max. Power          | Not support   |        |        |       |        |        |
| 6    | EDGE<br>Modulation Accuracy | Not support   |        |        |       |        |        |

## 2. PERFORMANCE

| Item | Description                               | Specification              |            |
|------|---|----------------------------|------------|
| 7    | Output RF Spectrum<br>(Due to Modulation) | <b>GSM900</b>              |            |
|      |   | Offset from Carrier (kHz). | Max. [dBc] |
|      |   | 100                        | 0.5        |
|      |   | 200                        | -30        |
|      |   | 250                        | -33        |
|      |   | 400                        | -60        |
|      |   | 600 ~ 1,200                | -60        |
|      |   | 1,200 ~ 1,800              | -60        |
|      |   | 1,800 ~ 3,000              | -63        |
|      |   | 3,000 ~ 6,000              | -65        |
|      |   | 6,000                      | -71        |
|      |   | <b>DCS1800</b>             |            |
|      |   | Offset from Carrier (kHz). | Max. [dBc] |
|      |   | 100                        | 0.5        |
|      |   | 200                        | -30        |
|      |   | 250                        | -33        |
|      |   | 400                        | -60        |
|      |   | 600 ~ 1,200                | -60        |
|      |   | 1,200 ~ 1,800              | -60        |
|      |   | 1,800 ~ 3,000              | -65        |
|      |   | 3,000 ~ 6,000              | -65        |
|      |   | 6,000                      | -73        |
| 8    | Output RF Spectrum<br>(Due to Switching)  | <b>GSM900</b>              |            |
|      |   | Offset from Carrier (kHz)  | Max. [dBm] |
|      |   | 400                        | -19        |
|      |   | 600                        | -21        |
|      |   | 1,200                      | -21        |
|      |   | 1,800                      | -24        |

## 2. PERFORMANCE

| Item | Description                              | Specification   |          |            |
|------|--|---|----------|------------|
| 8    | Output RF Spectrum<br>(Due to Switching) | DCS1800   |          |            |
|      |  | Offset from Carrier (kHz)   |          | Max. [dBm] |
|      |  | 400   |          | -22        |
|      |  | 600   |          | -24        |
|      |  | 1,200   |          | -24        |
|      |  | 1,800   |          | -27        |
| 9    | Spurious Emissions                       | Conduction, Emission Status   |          |            |
|      |  | Radiation, Emission Status  |          |            |
| 10   | Bit Error Ratio                          | GSM900<br>BER (Class II) < 2.439% @-102dBm<br>DCS1800<br>BER (Class II) < 2.439% @-102dBm |          |            |
| 11   | Rx Level Report accuracy                 | ±3 dB   |          |            |
| 12   | SLR                                      | 8±3 dB  |          |            |
| 13   | Sending Response                         | Frequency (Hz)  | Max.(dB) | Min.(dB)   |
|      |  | 100   | -12      | -          |
|      |  | 200   | 0        | -          |
|      |  | 300   | 0        | -12        |
|      |  | 1,000   | 0        | -6         |
|      |  | 2,000   | 4        | -6         |
|      |  | 3,000   | 4        | -6         |
|      |  | 3,400   | 4        | -9         |
|      |  | 4,000   | 0        | -          |
| 14   | RLR(Normal volume)                       | -4±3 dB   |          |            |
| 15   | Receiving Response<br>(Type 3.2)         | Frequency (Hz)  | Max.(dB) | Min.(dB)   |
|      |  | 100   | -6       | -          |
|      |  | 200   | 2        | -          |
|      |  | 300   | 2        | -9         |
|      |  | 1,000   | 2        | -7         |
|      |  | 3,400   | 2        | -12        |
|      |  | 4,000   | 2        | -          |



## 2. PERFORMANCE

| Item | Description          | Specification   |
|------|----------------------|---|
| 16   | STMR                 | > 17 dB   |
| 17   | Echo Loss            | > 40 dB   |
| 18   | Idle Noise Sending   | < -64 dBm0p   |
| 19   | Idle Noise Receiving | < -36 dBm0p   |
| 20   | Power consumption    | Max. power<br>< 330mA @GSM850, PL=5<br>< 250mA @PCS, PL=0   |
|      |                      | Standby<br>< 5.5mA @PP2<br>< 3.3mA @PP5<br>< 2.7mA @PP9   |
|      |                      | Bluetooth<br>(not support)  |
|      |                      | FM radio<br>(not support)   |
|      |                      | Backup Battery(Without Main Battery)<br>Normal Power Off: < 5uA<br>Emergency Power Off: < 15uA  |
| 21   | Talk Time            | 2.2 hr., Min.@GSM900, PL=5<br>4.0 hr., Min.@GSM900, PL=12<br>3.0 hr., Min.@DCS, PL=0<br>5.0 hr., Min.@DCS, PL=10  |
| 22   | Standby Time         | 270 hr., Min.@PP9<br>220 hr., Min.@PP5  |
|      |                      | - Full charge, no receive/send and keep GSM in idle mode<br>Broadcast set off. Signal strength display set at 3 levelabove. Backlight of phone set off. |
| 23   | Ringer Volume(TBD)   | At least 55 dB under below conditions:  |
|      |                      | 1. Ringer set as ringer.  |
|      |                      | 2. Test distance set as 1 m.  |
| 24   | Charge Current       | Fast Charge: < 500 mA<br>Slow Charge: < 120 mA  |
| 25   | Charging Time        | Under 3 hr.   |

## 2. PERFORMANCE

| Item | Description              | Specification   |                     |
|------|--------------------------|---|---------------------|
| 26   | Antenna Display          | Antenna Bar Number  | Power               |
|      |                          | 5   | -92 dBm ~           |
|      |                          | 4   | -100 dBm ~ -93 dBm  |
|      |                          | 3   | skip                |
|      |                          | 2   | -103 dBm ~ -101 dBm |
|      |                          | 1   | -105 dBm ~ -104 dBm |
|      |                          | 0   | ~ -105 dBm          |
| 27   | Battery Indicator(TBD)   | Battery Bar Number  | Voltage             |
|      |                          | 1 → 0   | 3.54V ± 0.05V       |
|      |                          | 2 → 1   | 3.64V ± 0.05 V      |
|      |                          | 3 → 2   | 3.75V ± 0.05 V      |
|      |                          | 3   | 4.2V                |
| 28   | Low Voltage Warning(TBD) | 3.54 ± 0.05 V (Call)  |                     |
|      |                          | 3.40 ± 0.05 V (Standby)   |                     |
| 29   | Forced shut down Voltage | 3.33 ± 0.05V  |                     |
| 30   | Battery Type             | Main Battery: Li-ion, 800mAh, Hard pack<br>Back-up Battery: Lithium, 1mAh |                     |
| 31   | Travel Charger           | Input: 100 ~ 240 V, 50/60Hz<br>Output: 4.8V, 900mA                        |                     |

### 3. TECHNICAL BRIEF

## 3. TECHNICAL BRIEF

### 3.1 TX module (SKY77517/SKY77518, U401)

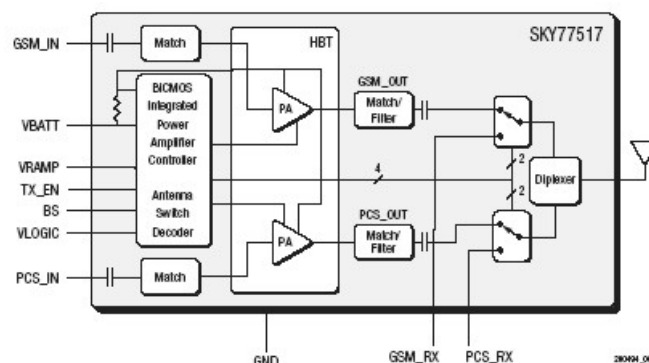
The SKY77517 is a Transmit and receive front-end-module (FEM) with Integrated Power Amplifier Control (iPAC) for dual-band cellular handsets comprising GSM850 and PCS1900 operation. Designed in a low profile, compact form factor, the SKY77517 offers a complete Transmit VCO-to-Antenna and Antenna-to-Receive SAW filter solution. The FEM also supports class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of a GSM850 PA block and a PCS1900 PA block, impedance-matching circuitry for 50 ohm input and output impedances, TX harmonics filtering, high linearity and low insertion loss PHEMT RF switches, diplexer and a Power Amplifier Control (PAC) block with internal current sense resistor. A custom BiCMOS integrated circuit provides the internal PAC function and decoder circuitry to control the RF switches. The two Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM850 band and the other PA block supports the PCS 1900 band. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the two receiver pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The GaAs die, PHEMT die, Silicon (Si) die and passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

Band selection and control of transmit and receive modes are performed using two external control pads. Refer to the functional block diagram in Figure 3.1 below. The band select pad (BS) selects between GSM and PCS modes of operation. The transmit enable (TX\_EN) pad controls receive or transmit mode of the respective RF switch (TX = logic 1). Proper timing between transmit enable (TX\_EN) and Analog Power Control (VRAMP) allows for high isolation between the antenna and TX\_VCO while the VCO is being tuned prior to the transmit burst.

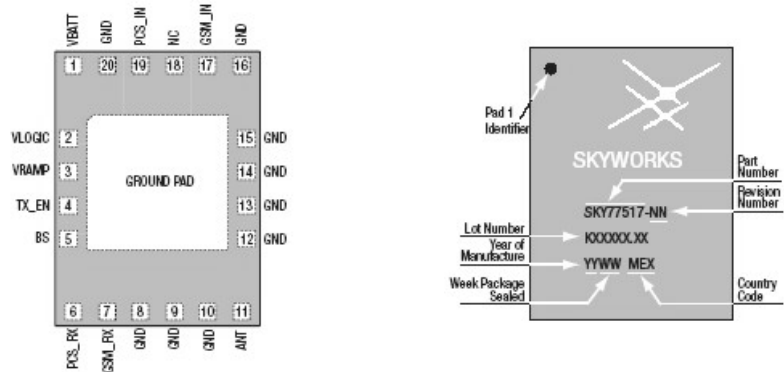
The SKY77517 is compatible with logic levels from 1.2V to VCC for BS and TX\_EN pads, depending on the level applied to the VLOGIC pad. This feature provides additional flexibility for the designer in the selection of FEM interface control logic.

The SKY77518 is Txmodule for GSM900/DCS1800 dual-band. Every function and logic is equal to the SKY77517.



**Figure 3.1.1 Functional Block Diagram**

### 3. TECHNICAL BRIEF



**Figure 3.1.2 Pad configuration (Top view) and case marking**

| Pin      | Mame        | Description                                   |
|----------|-------------|---|
| 1        | VCATT       | Battery input voltage                         |
| 2        | VLOGIC      | Control logic level selection/Standby control |
| 3        | VRAMP       | Analog power control voltage input            |
| 4        | TX_EN       | TX/RX select (mode control)                   |
| 5        | BS          | Band Select (mode control)                    |
| 6        | DCS_RX      | DCS Receive RF Output (1930-1990 MHz)         |
| 7        | GSM_RX      | GSM Receive RF Output (869-894 MHz)           |
| 8-10     | GND         | RF and DC Ground                              |
| 11       | ANT         | RF_IN/RF_OUT to Antenna                       |
| 12-16    | GND         | RF and DC Ground                              |
| 17       | GSM_IN      | RF input 824-849 MHz                          |
| 18       | NC          | No Connect                                    |
| 19       | DCS_IN      | RF input 1850-1910 MHz                        |
| 20       | GND         | RF and DC Ground                              |
| GMD PADS | GROUND GRID | Ground Pads, module underside                 |

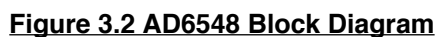
**Table 3.1.1 Pad description**

| Mode    | VLogic | Input Control Bits |    |
|---------|--------|--------------------|----|
|         |        | TX_En              | BS |
| STANDBY | 0      | X'                 | X' |
| GSM_RX  | 1      | 0                  | 0  |
| PCS_RX  | 1      | 0                  | 1  |
| GSM_TX  | 1      | 1                  | 0  |
| PCS_TX  | 1      | 1                  | 1  |

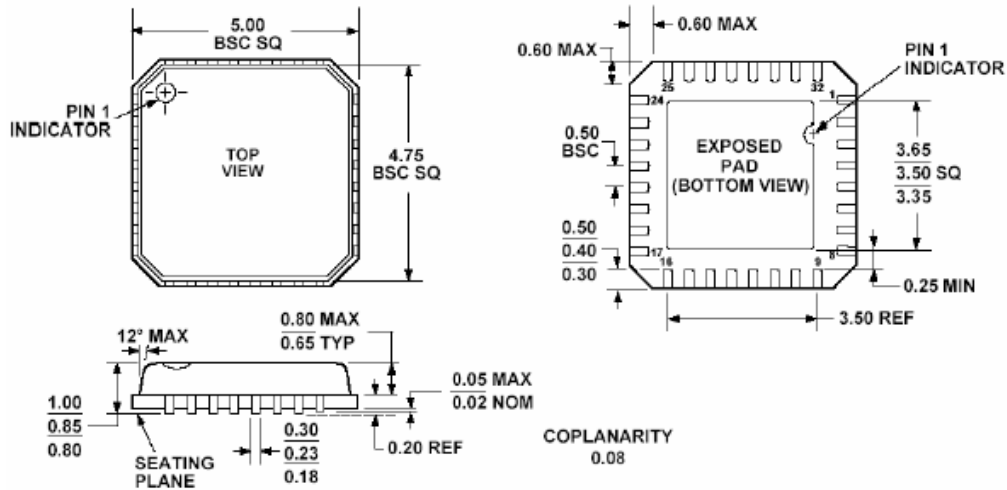
**Table 3.1.2 Mode Control logic**

The AD6548 provides a highly integrated direct conversion radio solution that combines, on a single chip, all radio and power management functions necessary to build the most compact GSM radio solution possible. The only external components required for a complete radio design are the Rx SAWs, PA, Switchplexer and a few passives enabling an extremely small cost effective GSM Radio solution. The AD6548 uses the industry proven direct conversion receiver architecture of the Othello™ family. For Quad band applications the front end features four fully integrated programmable gain differential LNAs. The RF is then down converted by quadrature mixers and then fed to the baseband programmable-gain amplifiers and active filters for channel selection. The Receiver output pins can be directly connected to the baseband analog processor. The Receive path features automatic calibration and tracking to remove DC offsets. The transmitter features a translation-loop architecture for directly modulating baseband signals onto the integrated TX VCO.

AD6548 incorporates a complete reference crystal calibration system. This allows the external VCTCXO to be replaced with a low cost crystal. No other external components are required. The AD6548 uses the traditional VCTCXO reference source. The AD6548 also contains on-chip low dropout voltage regulators (LDOs) to deliver regulated supply voltages to the functions on chip, with a battery input voltage of between 2.9V and 5.5V. Comprehensive power down options are included to minimize power consumption in normal use. A standard 3 wire serial interface is used to program the IC. The interface features low-voltage digital interface buffers compatible with logic levels from 1.6V to 2.9V.



### 3. TECHNICAL BRIEF



#### COMPLIANT TO JEDEC STANDARDS MO-220-VHHD-2

| No | Name      | Description                     | No | Name         | Description   |
|----|-----------|---------------------------------|----|--------------|---|
| 1  | VCC_FE    | Front end supply (IP)           | 17 | VCC_REF      | Reference Oscillator Supply (IP)                      |
| 2  | I         | I baseband input/output         | 18 | VAFC/<br>N/C | AD6548 Crystal Freq control (IP)<br>AD6549: Spare Pin |
| 3  | IB        | I baseband input/output         | 19 | REFIN        | Crystal Connection                                    |
| 4  | VCC_BBI   | Baseband I, TX path supply (IP) | 20 | REFINB       | Crystal Connection                                    |
| 5  | SDATA     | Serial port data                | 21 | REF_OP       | Reference Frequency Output                            |
| 6  | SCLK      | Serial port clock               | 22 | QB           | Q baseband input/output                               |
| 7  | SEN       | Serial port enable              | 23 | Q            | Q baseband input/output                               |
| 8  | N/C       | Not connected                   | 24 | VCC_BBQ      | Baseband Q supply (IP)                                |
| 9  | VLDO3     | TX LDO Output (1)               | 25 | RX1900B      | PCS 1900 LNA input                                    |
| 10 | TXOP_LO   | Transmit O/P (850/900MHz)       | 26 | RX1900       | PCS 1900 LNA input                                    |
| 11 | TXOP_HI   | Transmit O/P (1800/1900MHz)     | 27 | RX1800B      | DCS 1800 LNA input                                    |
| 12 | VCC_TXVCO | TX VCO supply (1)               | 28 | RX1800       | DCS 1800 LNA input                                    |
| 13 | VDD       | Serial interface supply         | 29 | RX900B       | E-GSM LNA input                                       |
| 14 | VBAT      | Battery I/P for LDO reg's       | 30 | RX900        | E-GSM LNA input                                       |
| 15 | VLDO1     | LDO regulator Output (2)        | 31 | RX850B       | GSM 850 LNA input                                     |
| 16 | VLDO2     | LO VCO Supply (3)               | 32 | RX850        | GSM 850 LNA input                                     |

#### AD6548/9 Pin Descriptions

##### Notes:

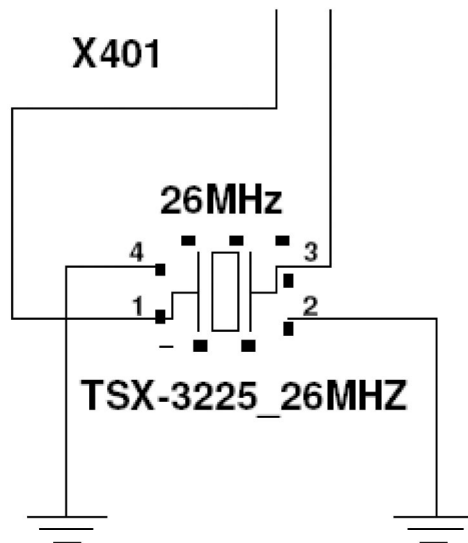
1. Supply regulated by internal LDO3 and should not be connected to any other supply
2. Internally connected as Synth supply (Counters + SDM + Charge pump)
3. Supply regulated by internal LDO2 and should not be connected to any other supply

### 3. TECHNICAL BRIEF

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#### 3.3 26 MHz Clock (Crystal, X401)

The 26 MHz clock (X401) consists of a XO (Crystal Oscillator) which oscillates at a frequency of 26 MHz. The AD6548 requires only an external low cost crystal as the frequency reference. The circuitry to oscillate the crystal and tune its frequency is fully integrated. The Oscillator is a balanced implementation requiring the crystal to be connected across 2 pins. There is a programmable capacitor array included for coarse tuning of fixed offsets (e.g. crystal manufacturing tolerance), and an integrated varactor for dynamic control. The oscillator is designed for use with a 26MHz crystal. Dedicated control software ensures excellent frequency stability under all circumstances.



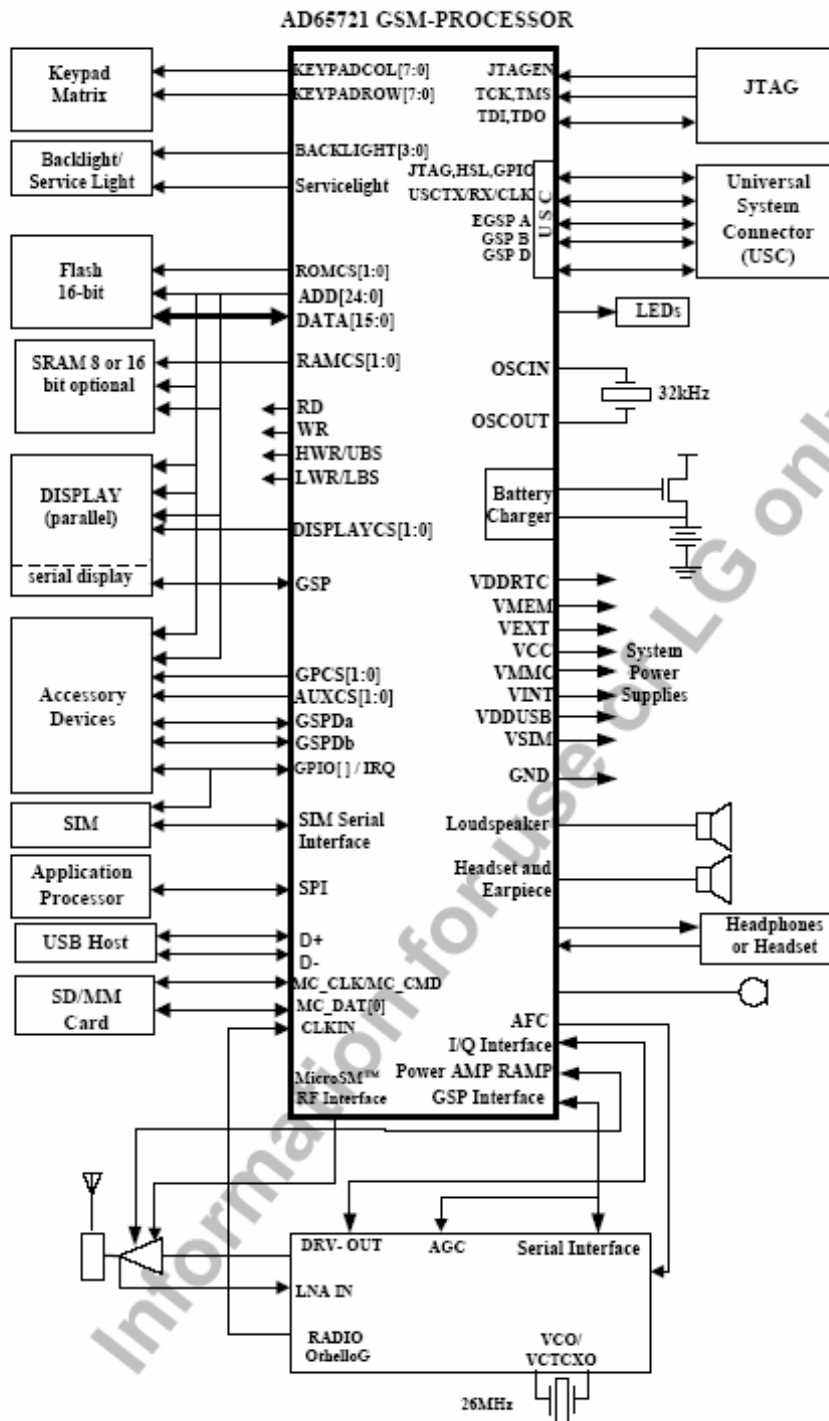
**Figure 3.3 CRYSTAL CIRCUIT DIAGRAM**

### 3.4 Baseband Processor (AD6721, U102)

- AD6721 is an ADI designed processor
- AD6721 consists of
  1. Control Processor Subsystem including:
    - 32-bit MCU ARM7TDMI® Control Processor
    - 65 MHz operation at 1.8V
    - 2Mb of on-chip System SRAM Memory
  2. DSP Subsystem including:
    - 16-bit Fixed Point DSP Processor
    - 91 MIPS[1] at 1.8V
    - Data and Program SRAM
    - Program Instruction Cache
    - Full Rate, Enhanced Full Rate and Half Rate
    - Speech Encoding/Decoding
    - Capable of Supporting AMR & PDC Speech Algorithms
  3. Peripheral Functions
    - Parallel and Serial Display Interface
    - USB 2.0 Full Speed device Interface
    - Keypad Interface
    - Flash Memory Interface
    - Page-Mode Flash Support
    - 1.8V and 3.0V, 64 kbps SIM Interface
    - Universal System Connector Interface
    - Data Services Interface
    - Battery Interface (e.g. Dallas)
  4. Other
    - Supports 13 MHz and 26 MHz Input Clocks
    - 1.8V Typical Core Operating Voltages
    - 361-Ball Package (13x13mm) , 0.65mm Ball pitch
  5. The AD6721 baseband transmit section supports the following mobile station GMSK modulation power classes:
    - GSM 900/850 power classes 4 and 5,
    - DCS 1800 power classes 1 and 2, and
    - PCS 1900 power classes 1 and 2



### 3. TECHNICAL BRIEF



**Figure 3.4 SYSTEM INTERCONNECTION OF AD6721 EXTERNAL INTERFACE**

### 3.4.1 Interconnection with external devices

#### A. RTC block interface

Countered by external X-TAL

The X-TAL oscillates 32.768KHz

#### B. LCD module interface

The LCD module is controlled by Camera backend IC AIT701G

If AIT701G is in the state of by-pass mode, the LCD control signals from AD6721 are by-passed through AIT701G.

In operating mode, the AIT701G controls the LCD module through L\_MAIN\_LCD\_CS, L\_SUB\_LCD\_CS, LCD\_RESET, LCD\_RS, LCD\_WR, L\_DATA[15-00], 2V8\_MV, LCD\_IF, LCD\_ID.

| Signals         | Description   |
|-----------------|---|
| L_MAIN_LCD_CS   | MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin  |
| pinL_SUB_LCD_CS | SUB LCD driver chip enable. SUB LCD driver IC has own CS pin  |
| LCD_ID          | Select LCD module maker   |
| LCD_RESET       | This pin resets LCD module. This signal comes from AD6721 directly.   |
| LCD_WR          | Enable writing to LCD Driver.   |
| LCD_RD          | Enable reading to LCD Driver.   |
| LCD_RS          | This pin determines whether the data to LCD module are display data or control data. LCD_RS can select 16 bit parallel bus. |
| 2V8_CAM         | 2.8V voltage is supplied to LCD driver IC.  |
| IF_MODE         | Select 16bits or 8bits interface mode for MAIN LCD.<br>For the future   |

**Table 3.4.B LCD CONTRON SIGNALS DISCRIPTION**

### 3. TECHNICAL BRIEF

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The backlight of LCD module is controlled by AD6721 via AAT3155.  
The control signals related to Backlight LED are given bellow.

| Signals      | Description  |
|--------------|--|
| MLED         | Current source for backlight LED                                     |
| LCD_DIM_CTRL | Control LCD backlight level in 16 steps                              |
| MLED[1:4]    | This pins are returned-paths for backlight LED current source (MLED) |

**Table 3.4.B2 DESCRIPTION OF LCD BACKLIGHT LED CONTROL**

#### C. RF interface

The AD6721 control RF parts through PA\_BAND, ANT\_SW1, ANT\_SW2, ANT\_SW3 , CLKON , PA\_EN, S\_EN, S\_DATA, S\_CLK

| Signals          | Description                |
|------------------|----------------------------|
| PA_BAND (GPO 17) | PAM Band Select            |
| ANT_SW1 (GPO 9)) | Antenna switch Band Select |
| ANT_SW2 (GPO 10) | Antenna switch Band Select |
| PA_EN (GPO 16)   | PAM Enable/Disable         |
| S_EN (GPO 19)    | PLL Enable/Disable         |
| S_DATA (GPO 20)  | Serial Data to PLL         |
| S_CLK (GPO 21)   | Clock to PLL               |

**Table 3.4.C RF CONTROL SIGNALS DESCRIPTION**

#### D. SIM interface

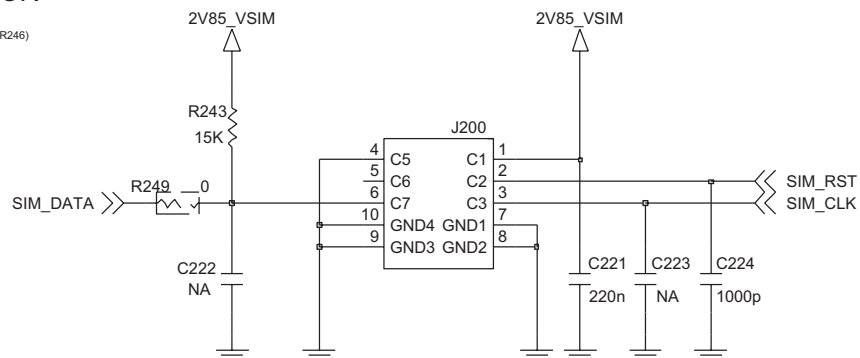
The AD6721 provides SIM Interface Module. The AD6721 checks status periodically during established call mode whether SIM card is inserted or not, but it doesn't check during deep Sleep mode. In order to communicate with SIM card, 3 signals SIM\_DATA, SIM\_CLK, SIM\_RST(GPIO\_23) are required. The descriptions about the signals are given by bellow Table 3-4 in detail.

| Signals              | Description   |
|----------------------|---|
| SIM_DATA             | This pin receives and sends data to SIM card.<br>This model can support 3.0 volt and 1.8 volt interface SIM card. |
| SIM_CLK              | Clock 3.25MHz frequency.  |
| SIM_RST<br>(GPIO_23) | Reset SIM block   |

**Table 3.4.D SIM CONTROL SIGNALS DESCRIPTION**

#### SIM CONNECTOR

[Rev.C] Remove N.A. resistor (R246)



**Figure 3.4.D2 SIM Interface of AD6721**

### 3. TECHNICAL BRIEF

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#### E. LDO Block

There are 9 LDOs in the AD6721.

- 1V8\_VCORE: supplies Digital baseband Processor core and AD6721 digital core(1.8V, 80mA)
- 2V8\_VMEM: supplies external memory and the interface to the external memory on the digital baseband processor (2.8V, 150mA)
- 2V8\_VEXT: supplies Radio digital interface and high voltage interface (2.8V, 200mA)
- 2V85\_VSIM: the SIM interface circuitry on the digital processor and SIM card (2.85V, 1.8V, 20mA)
- 1V8\_VRTC: supplies the Real-Time Clock module (1.8 V, 20  $\mu$ A)
- 2V5\_VMIC: supplies the microphone interface circuitry (2.5 V, 2 mA)
- 2V75\_VVCXO: supplies the voltage controlled crystal oscillator (2.75 V, 10 mA)
- VUSB: supplies USB interface circuitry(3.2V, 20mA)
- VGP: supplies VDD\_IO3 of MMP(3.2V, 40mA)

### 3.5 Display and Interface

#### • Main LCD

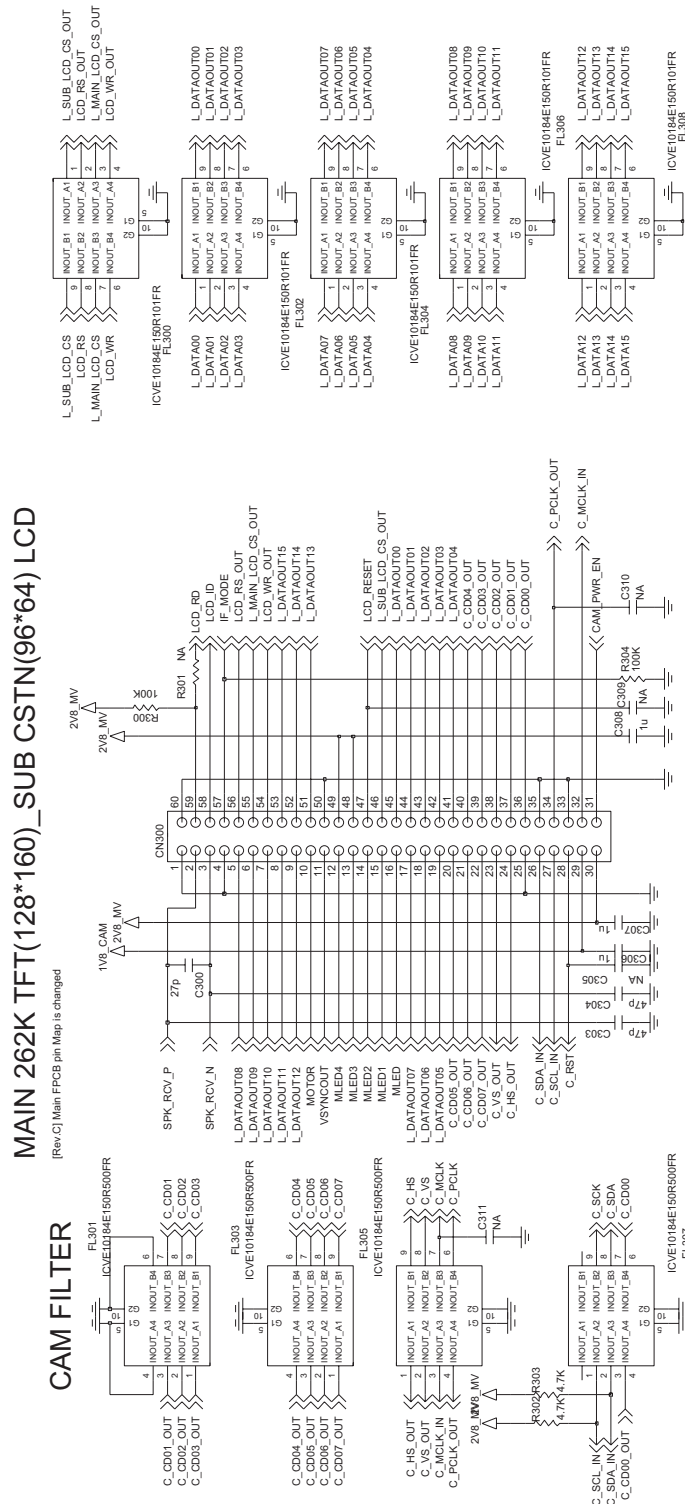
| Properties         | Spec.                  | Unit   |
|--------------------|------------------------|--------|
| Active Screen Size | 33.8mm(W) x 46.24mm(H) | mm     |
| Color Depth        | 262K TFT               | colors |
| Resolution         | 128 X 160              | dots   |

#### • Sub LCD

| Properties         | Spec.                    | Unit   |
|--------------------|--------------------------|--------|
| Active Screen Size | 18.902mm(W) x 13.43mm(H) | mm     |
| Color Depth        | 65K CSTN                 | colors |
| Resolution         | 96 x 64                  | dots   |

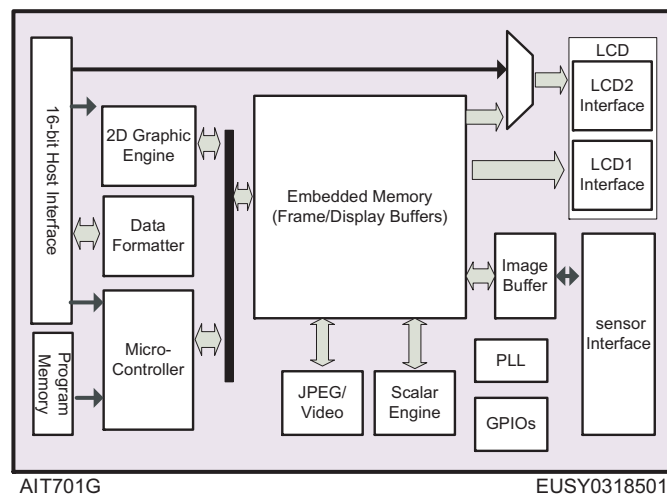
Controlled by L\_MAIN\_LCD\_CS, L\_SUB\_LCD\_CS, LCD\_RESET, LCD\_RS, LCD\_WR, LCD\_RD, LCD\_IF, L\_DATA[00:15] ports

- L\_MAIN\_LCD\_CS: MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
- LCD\_RESET: This pin resets LCD module. This signal comes from AD6721 directly.
- LCD\_RS: This pin determines whether the data to LCD module are display data or control data.
- LCD\_WR: Write control Signal
- LCD\_RD: Read control Signal. But this pin used only for debugging.
- L\_DATA[00:15]: Parallel data lines.
- LCD\_ID: LCD type selection signals
  - LCD\_ID: LCD maker(0V for LGIT, 2.8V for Sharp)
- For using 262K color, data buses should be 16 bits.

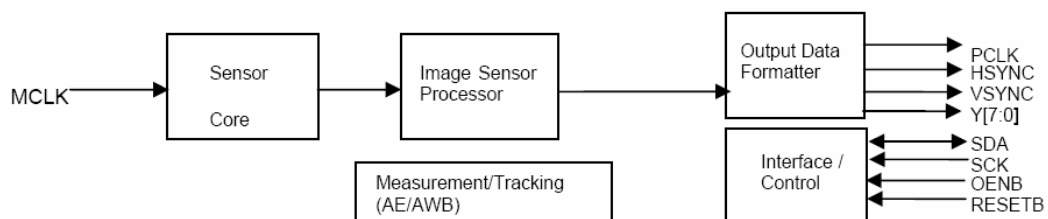


### 3.6 Camera Interface(AIT701G, U300)

This model has a built-in VGA(640 x 320) camera module. And the camera produces JPG pictures. Camera module is controlled by AIT701G. Interface is done by I2C and YCbCr format. I2C is a control signal and YCbCr is real data interface signal.



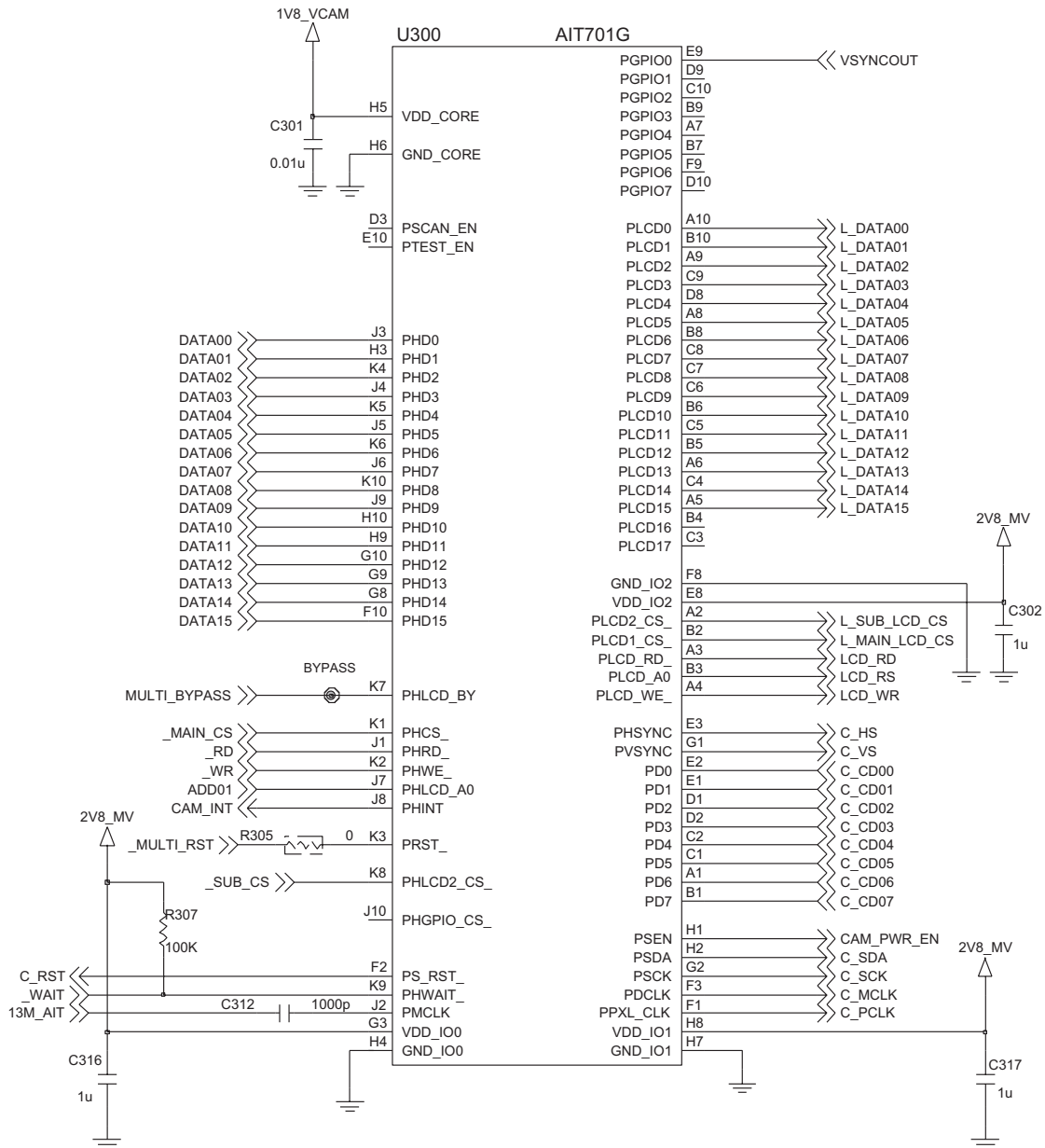
**Figure 3.6.1 AIT701G BLOCK DIAGRAM**



**Figure 3.6.2 SENSOR CHIP BLOCK DIAGRAM**



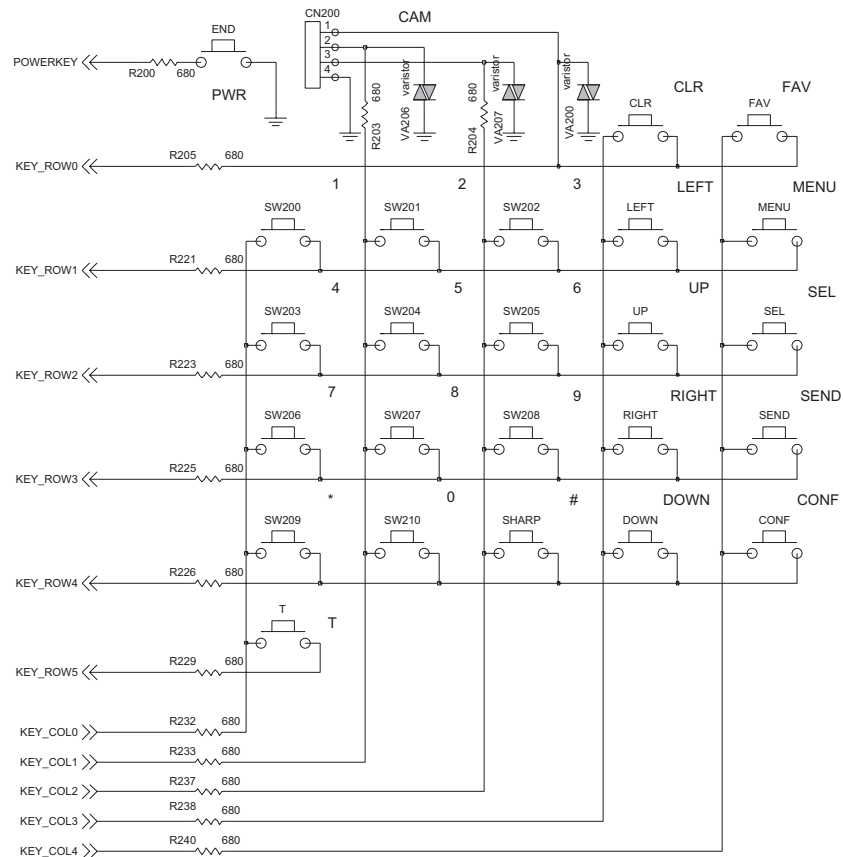
### 3. TECHNICAL BRIEF



**Figure 3.6.3 AIT701G CIRCUIT**

### 3.7 Keypad Switches and Scanning

The key switches are metal domes, which make contact between two concentric pads on the keypad layer of the PCB when pressed. There are 27 switches (Normal Key 23EA, Volume up down and camera side key, PWR down side key), connected in a matrix of 6 rows by 5 columns, as shown in Figure 3-7, except for the power switch (END), which is connected independently. Functions, the row and column lines of the keypad are connected to ports of AD6721. The columns are outputs, while the rows are inputs and have pull-up resistors built in. When a key is pressed, the corresponding row and column are connected together, causing the row input to go low and generate an interrupt. The columns/rows are then scanned by AD6721 to identify the pressed key.



**Figure 3.7 Keypad Switches and Scanning**

### 3. TECHNICAL BRIEF

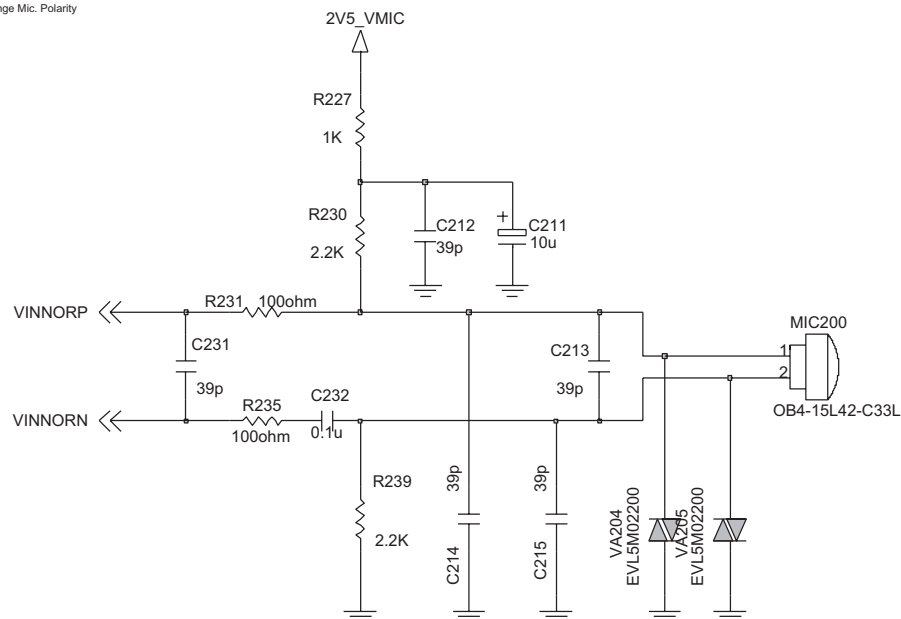
#### 3.8 Microphone

The microphone is placed to the Front cover and contacted to main PCB. The audio signal is passed to MIC\_N and MIC\_P pins of AD6721.

The voltage supply VMIC is output from AD6721, and is a biased voltage for the MIC\_P. The MIC\_P and MIC\_N signals are then A/D converted by the voice band ADC part of AD6721.

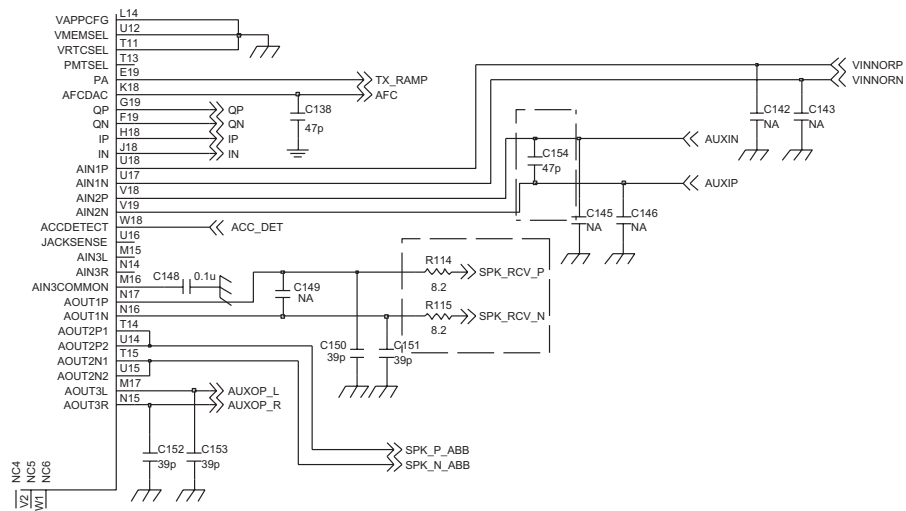
The digitized speech (PCM 8KHz ,16KHz) is then passed to the DSP section of AD6721 for processing (coding, interleaving etc).

[Rev.C] Exchange Mic. Polarity



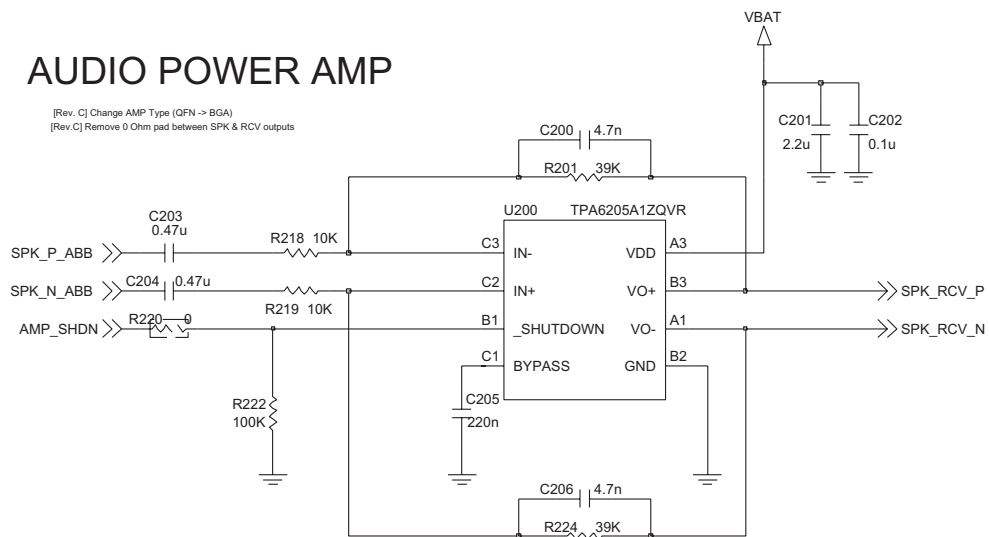
**Figure 3.8 Connection between Microphone and AD6721**

## 3.9 Main Speaker



## AUDIO POWER AMP

[Rev. C] Change AMP Type (QFN -> BGA)  
[Rev. C] Remove 0 Ohm pad between SPK & RCV outputs



**Figure 3.9 Connection between Speaker, Amp and AD6721**

### 3. TECHNICAL BRIEF

#### 3.10 Headset Interface

This phone has 6 electrodes such as GND, AUXIP, AUXIN, AUXOP\_L, AUXOP\_R, JACK\_SENSE ACC\_DETECT.

##### Switching from Receiver to Headset Jack

If jack is inserted, JACK\_SENSE goes from high to low.

Audio path is switched from receiver to earphone by JACK\_SENSE interrupt.

##### Switching from Headset Jack to Receiver

If jack is removed, JACK\_SENSE goes from low to high.

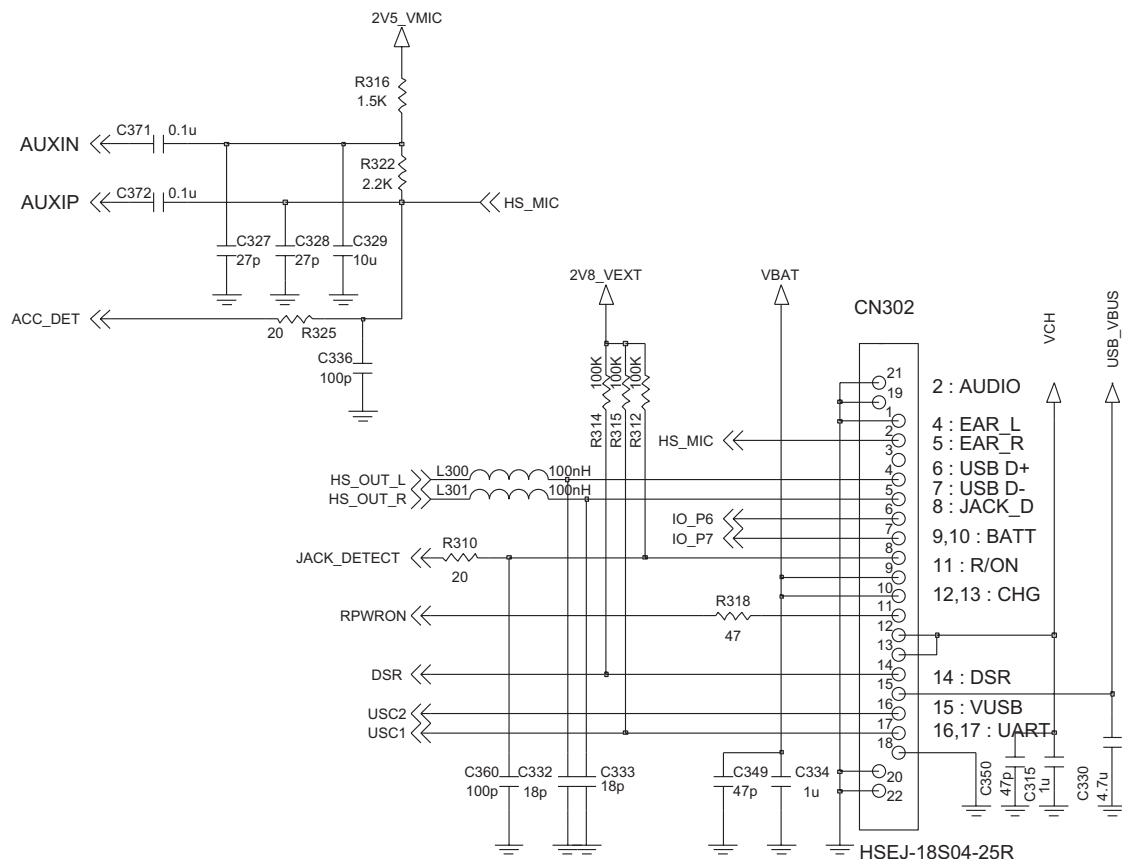
Audio path is switched from earphone to receiver by JACK\_DETECT interrupt.

##### Hook detection

If hook-button is pressed, ACC\_DET is changed from high to low.

This is detected by ACC\_DETECT of AD6721

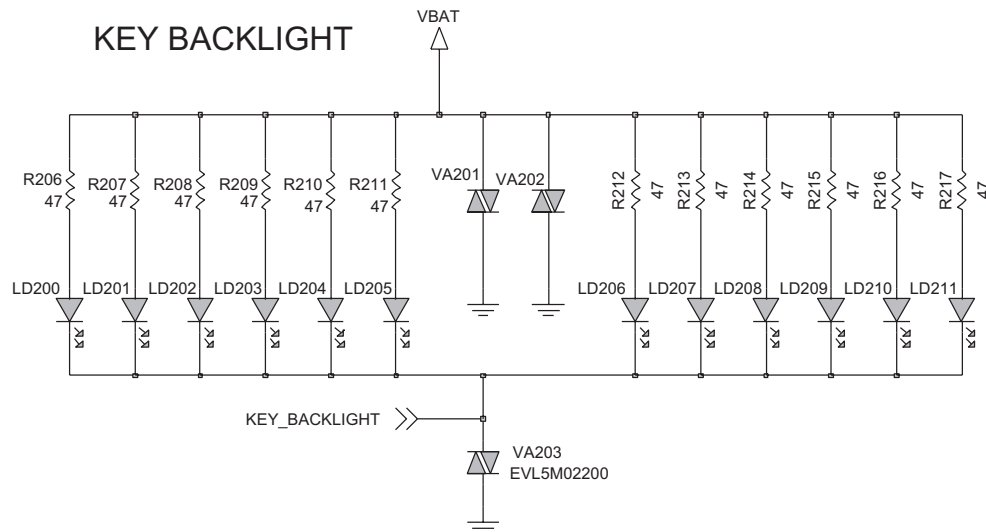
And then hook is detected.



**Figure 3.10 HEADSET JACK INTERFACE**

### 3.11 Key Back-light Illumination

In key back-light illumination, there are 12 Blue LEDs in Main Board, which are driven by KEY\_BACKLIGHT1 and 3 signal from AD6721.



**Figure 3.11 KEY BACK-LIGHT ILLUMINTION**

### 3.12 LCD Back-light Illumination

# CHARGE PUMP

The schematic diagram illustrates a charge pump circuit. The central component is the AAT3155 ITP-T1 IC (U302). Its pin connections are as follows:

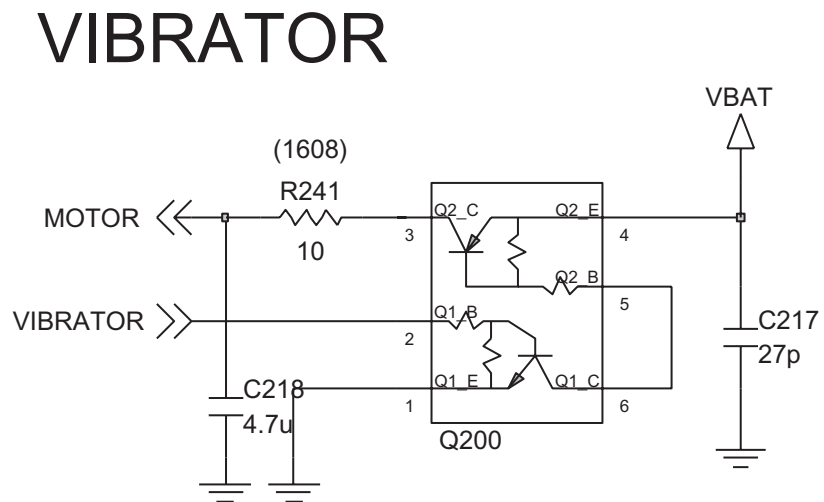
- Pin 5 (IN):** Connected to the VBAT supply.
- Pin 10 (C1+):** Connected to a 10µF capacitor (C320) to ground.
- Pin 9 (C1-):** Connected to a 1µF capacitor (C321) to ground.
- Pin 7 (C2+):** Connected to a 1µF capacitor (C324) to ground.
- Pin 6 (C2-):** Connected to a 1µF capacitor (C324) to ground.
- Pin 3 (D1):** Connected to a 27pF capacitor (C337) to ground.
- Pin 2 (D2):** Connected to a 27pF capacitor (C338) to ground.
- Pin 1 (D3):** Connected to a 27pF capacitor (C339) to ground.
- Pin 12 (D4):** Connected to a 27pF capacitor (C340) to ground.
- Pin 4 (GND):** Connected to ground.
- Pin 8 (OUTCP):** Connected to the MLED output through a feedback resistor FB300.
- Pin 11 (EN\_SET):** Connected to the LCD\_DIM\_CTRL input through a 1.5K resistor (R323). A 100K resistor (R326) and a 1µF capacitor (C331) are connected from this pin to ground.

The output of the charge pump (MLED) is connected to the MLED1, MLED2, MLED3, and MLED4 LEDs. The input signal LCD\_DIM\_CTRL is connected to the EN\_SET pin of the IC.

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Only for training and service purposes

### 3.13 VIBRATOR

The vibrator is placed in the folder cover and contacted to LCD MODULE. The vibrator is driven from VIBRATOR (GPIO\_3) of AD6721



**Figure 3.13 Vibrator**



### 3. TECHNICAL BRIEF

#### 3.14 Battery Charging

The ISL6299 accepts two power inputs, normally one from a USB port and the other from a TA.

##### Charging Process

- Connecting TA & Charger Detection
- Control the charging Current by U203(Charger IC)
- Charging Current flows into the Battery.

##### Pins of U203 used for charging

- CRDL: Charger supply.
- USB: USB charging supply.
- IMIN: IMIN is the programmable input for the end-of-charge current.
- ICDL: Program the cradle charge current during the constantcurrent mode.
- \_EN: Enable logic input
- BAT: Charger output pin.

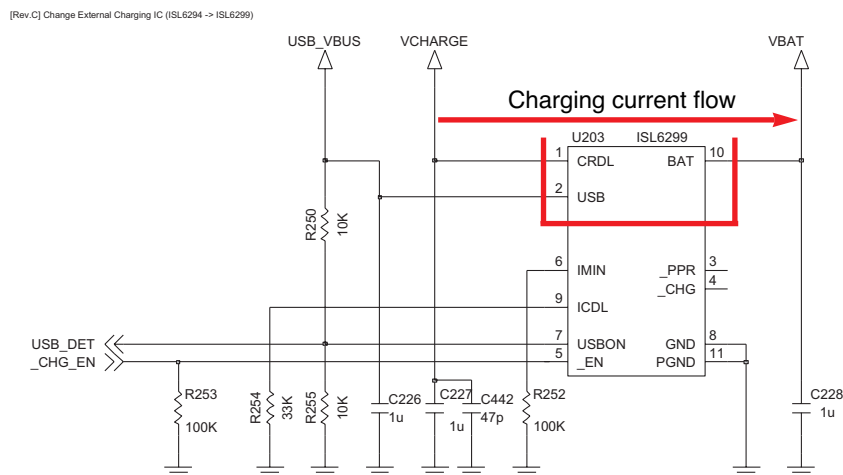
##### TA (Travel Adaptor)

- Input voltage: AC 100V ~ 250V, 63Hz
- Output voltage: DC 5.1V
- Output current: Max 700mA

##### Battery

- Li-ion battery (Max 4.2V, Nom 3.7V)
- Standard battery: Capacity - 800mAh

#### External Charger

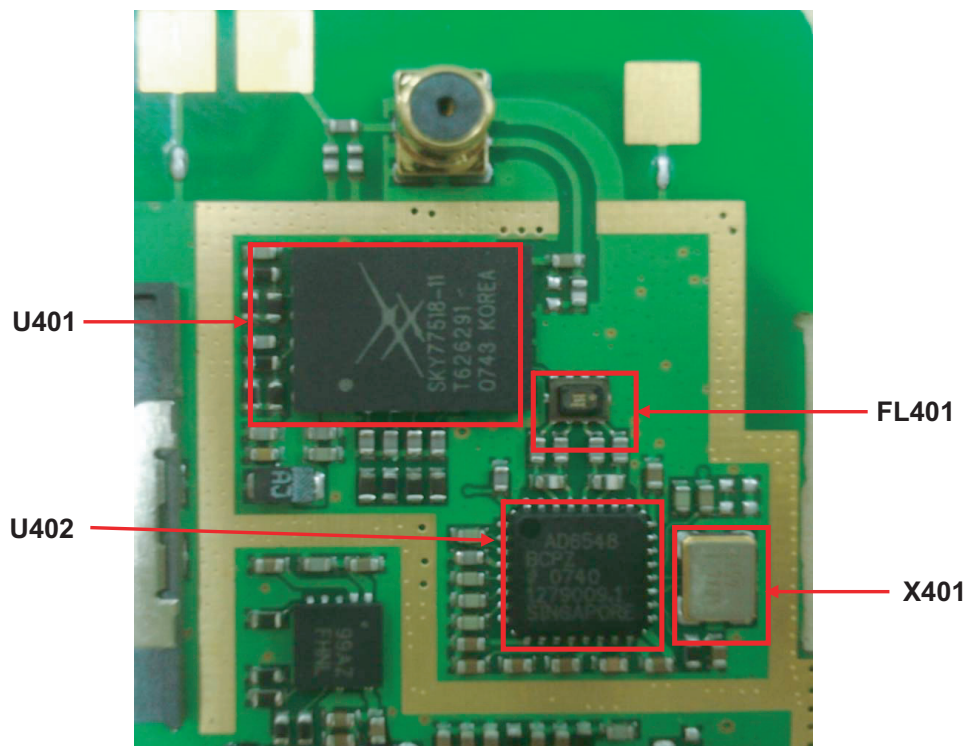


**Figure 3.14 CIRCUIT FOR BATTERY CHARGING**

## 4. TROUBLE SHOOTING

### 4.1 RF Component

#### TEST POINT



**Figure 4.1**

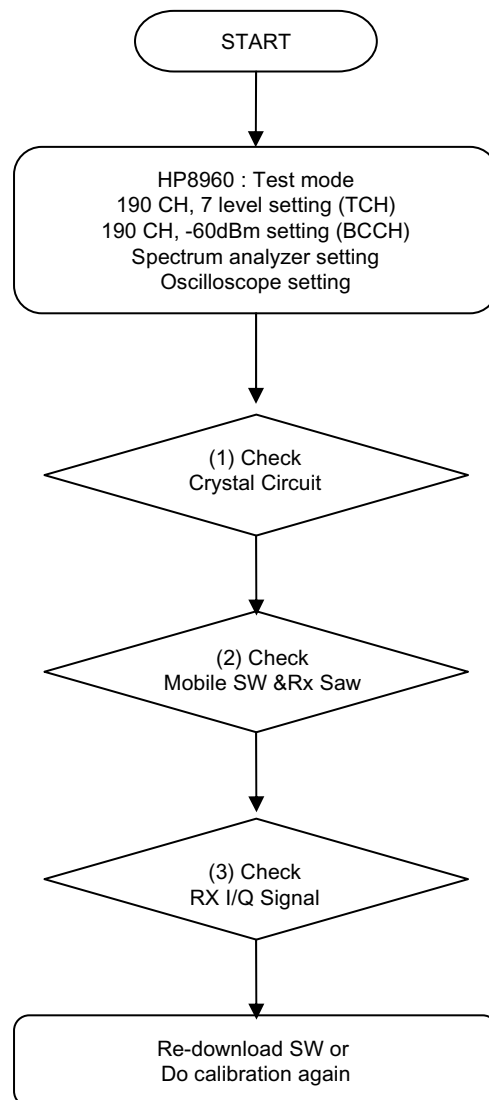
|                      |                            |
|----------------------|----------------------------|
| <b>U401</b>          | Tx Module (SKY77517)       |
| <b>U402 (AD6548)</b> | RF Main Chip (Transceiver) |
| <b>X401</b>          | Crystal, 26MHz Clock       |
| <b>FL401</b>         | Rx SAW filter              |

## 4. TROUBLE SHOOTING

---

### 4.2 RX Trouble

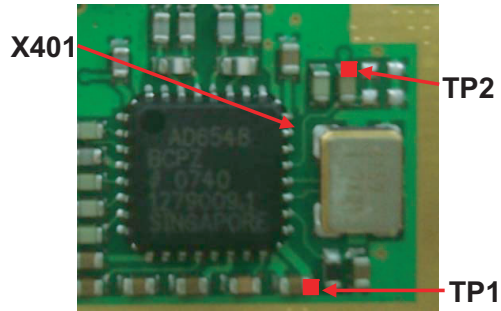
#### CHECKING FLOW



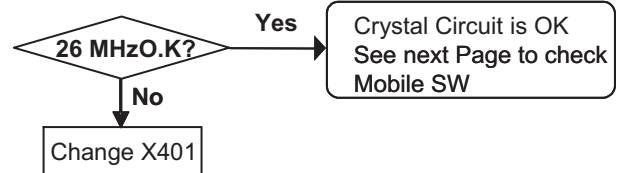
## 4. TROUBLE SHOOTING

### (1) Checking Crystal Circuit

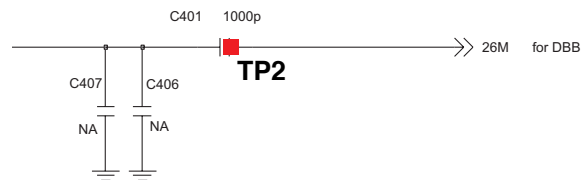
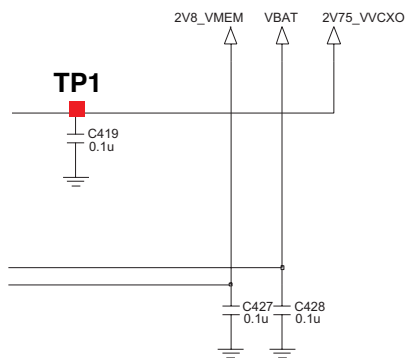
#### TEST POINT



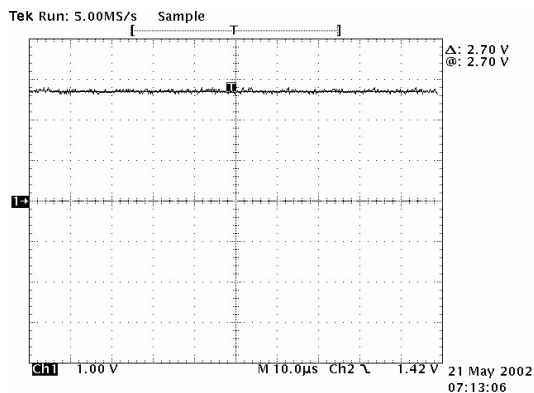
#### CHECKING FLOW



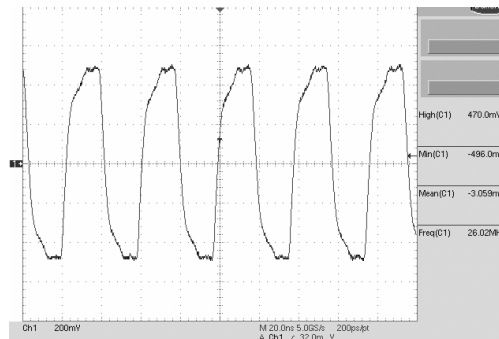
#### CIRCUIT



#### WAVEFORM



Graph 4.2.1(a)



Graph 4.2.1(b)

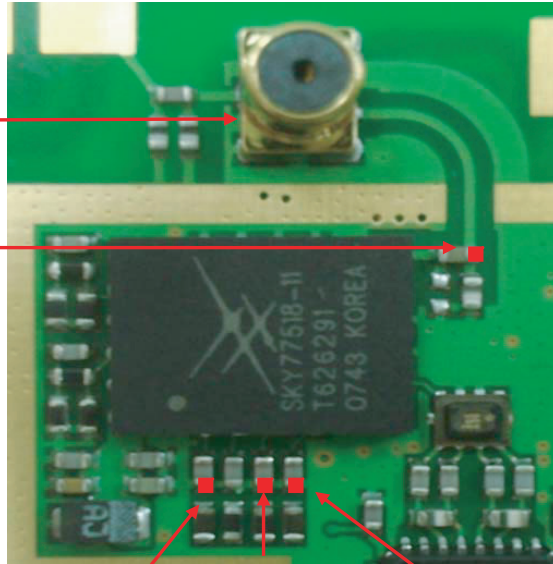
## 4. TROUBLE SHOOTING

### (2) Checking Mobile SW & Rx SAW filter

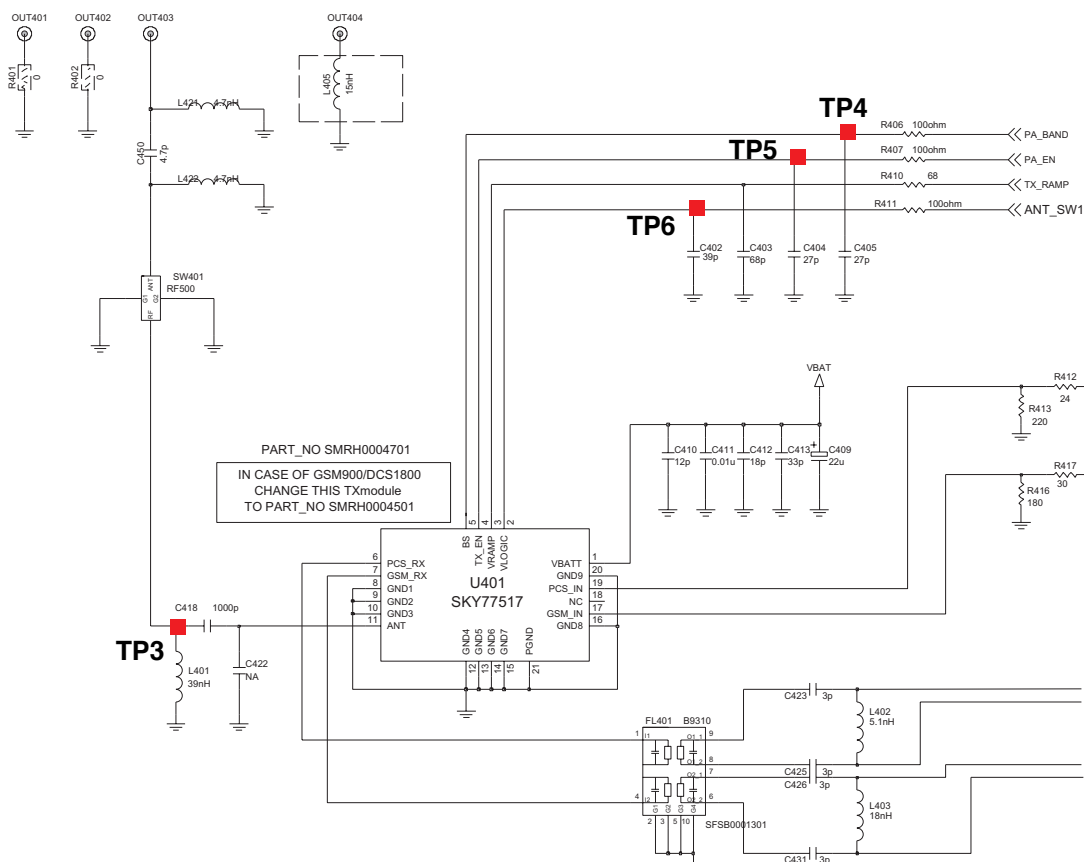
#### TEST POINT

SW401

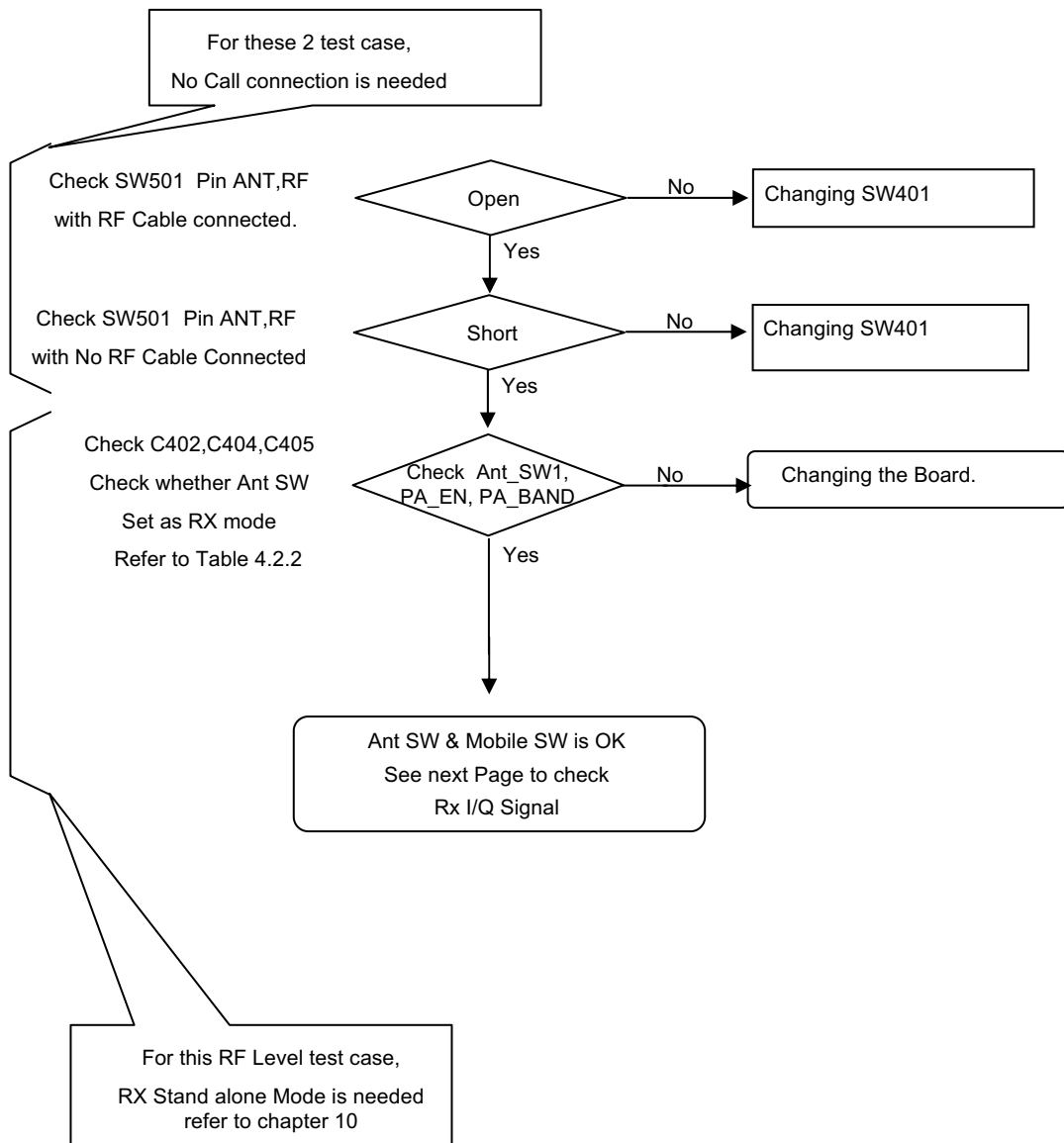
TP3



#### CIRCUIT



### CHECKING FLOW

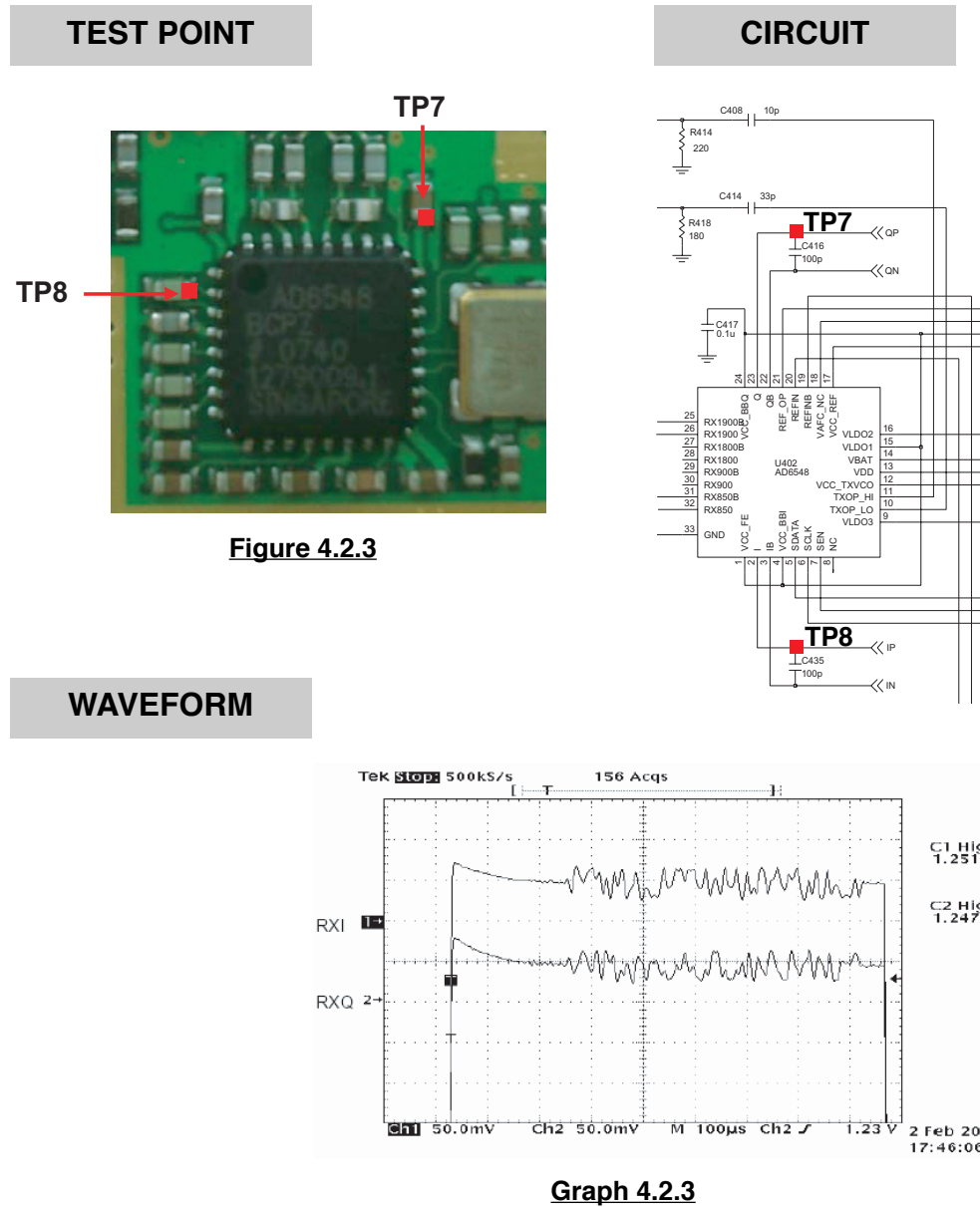


| MODE       | ANT_SW1 | PA_EN | PA_BAND |
|------------|---------|-------|---------|
| GSM850 RX  | H       | L     | L       |
| PCS1900 RX | H       | L     | H       |
| GSM850 TX  | H       | H     | L       |
| PCS1900 TX | H       | H     | H       |

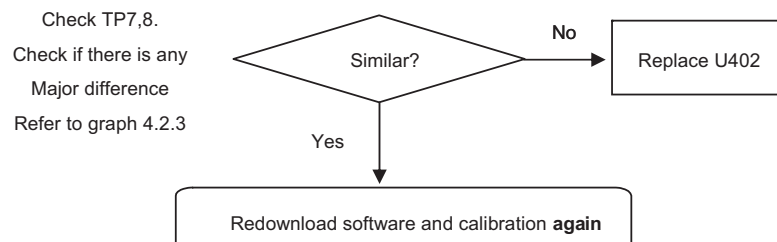
**Table 4.2.2**

## 4. TROUBLE SHOOTING

### (3) Checking RX I/Q

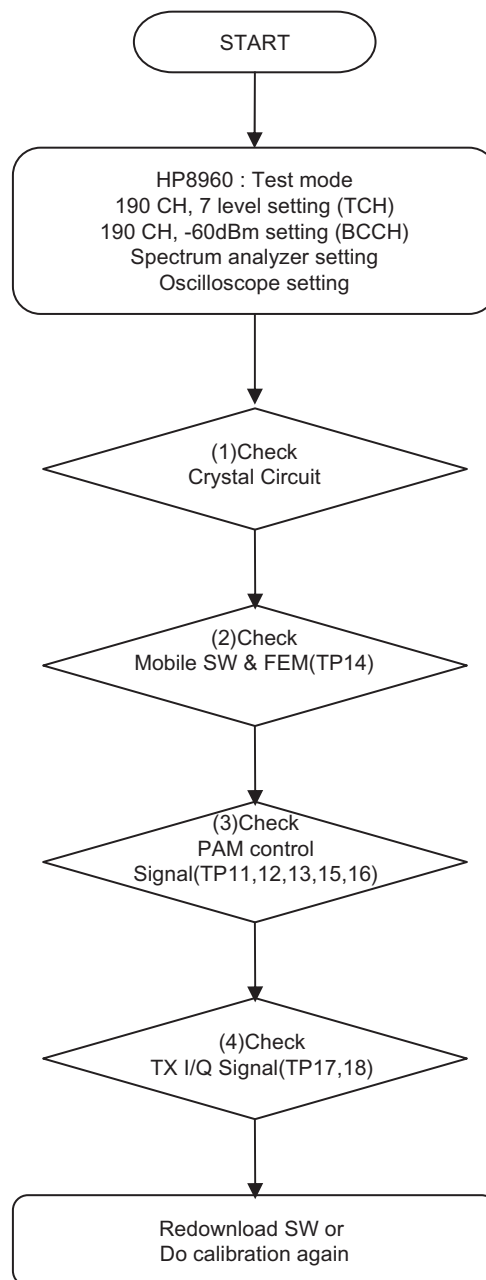


### CHECKING FLOW



### 4.3 TX Trouble

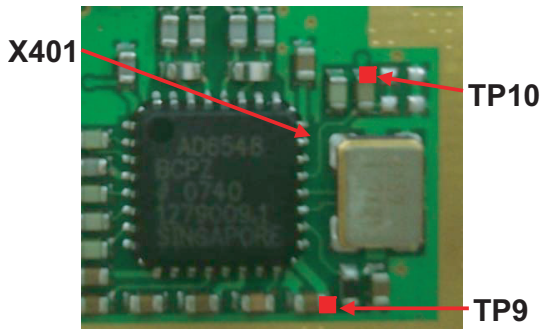
#### CHECKING FLOW



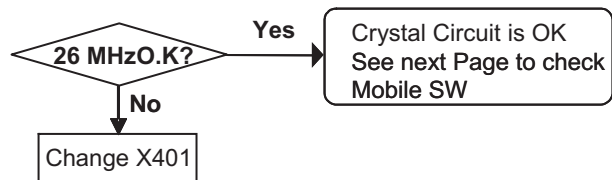


## (1) Checking Crystal Circuit

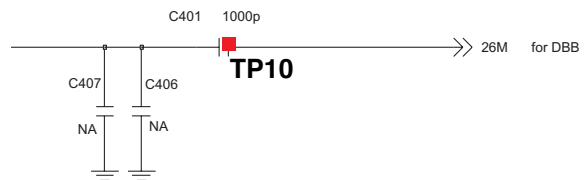
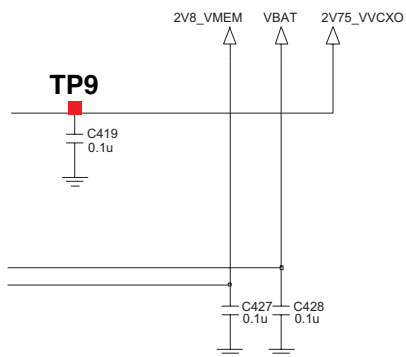
### TEST POINT



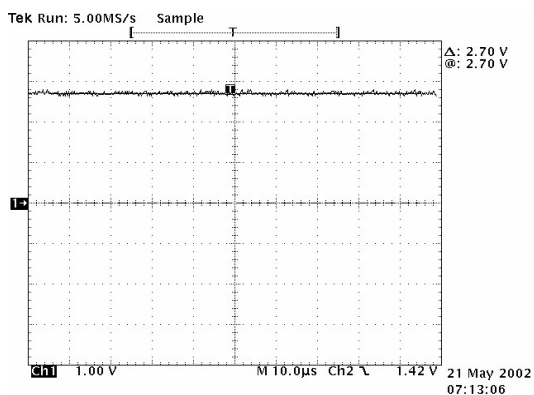
### CHECKING FLOW



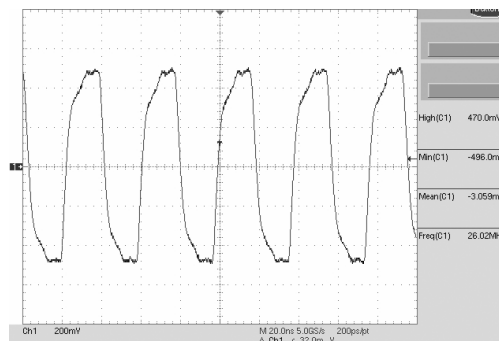
### CIRCUIT



### WAVEFORM



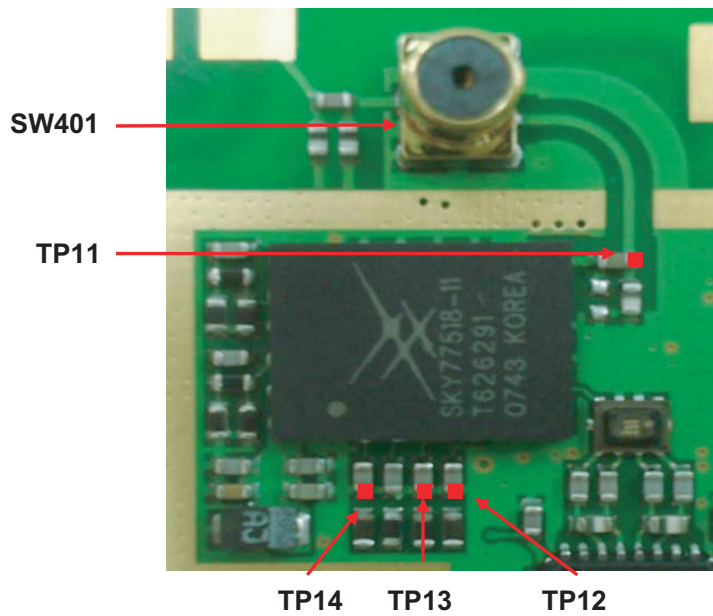
Graph 4.3.1(a)



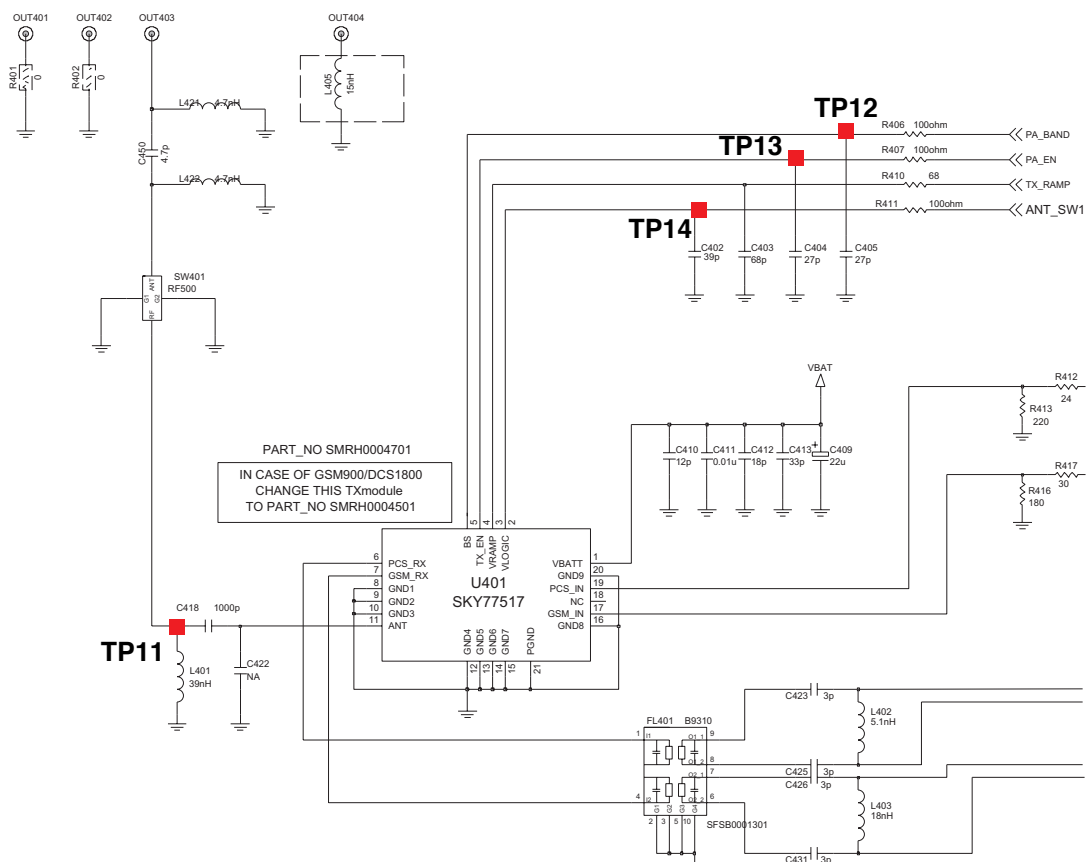
Graph 4.3.1(b)

## (2) Checking Mobile SW & FEM

### TEST POINT

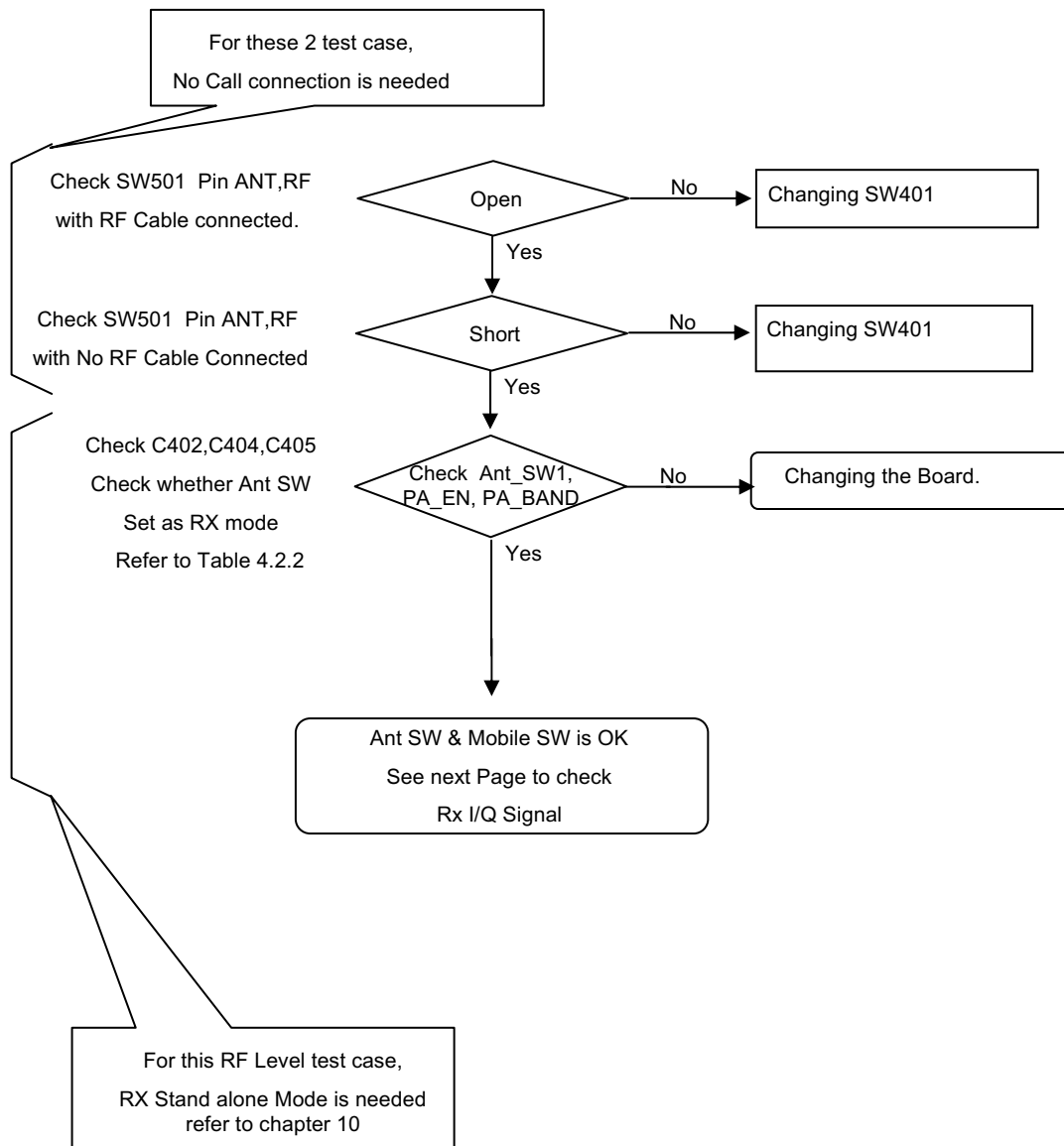


### CIRCUIT



## 4. TROUBLE SHOOTING

### CHECKING FLOW



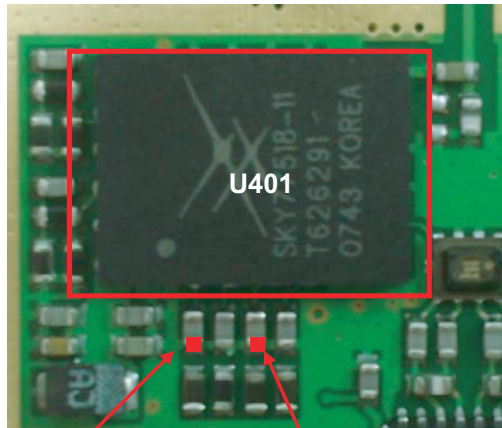
| MODE       | ANT_SW1 | PA_EN | PA_BAND |
|------------|---------|-------|---------|
| GSM850 RX  | H       | L     | L       |
| PCS1900 RX | H       | L     | H       |
| GSM850 TX  | H       | H     | L       |
| PCS1900 TX | H       | H     | H       |

**Table 4.3.2**

## 4. TROUBLE SHOOTING

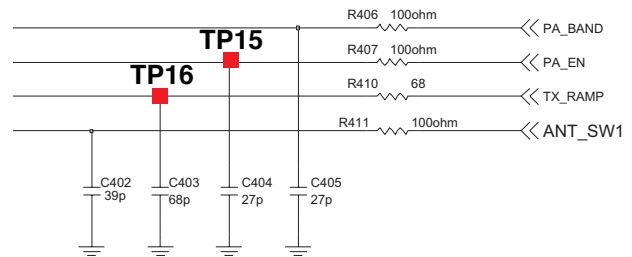
### (3) Checking PAM Control Signal

#### TEST POINT

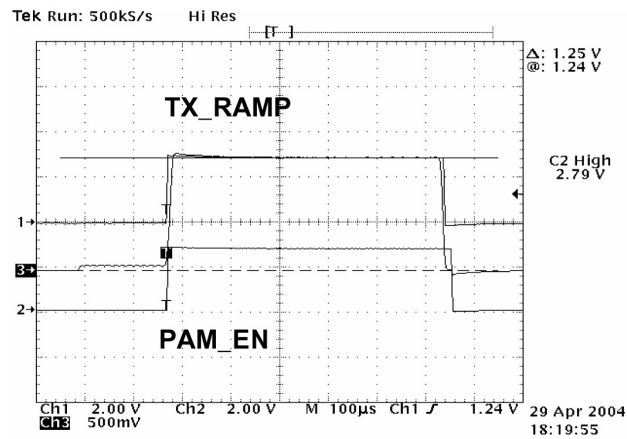


TP16 **Figure 4.3.3** TP15

#### CIRCUIT



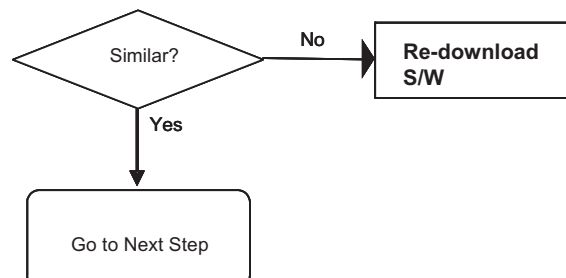
#### WAVEFORM



**Graph 4.3.3**

#### CHECKING FLOW

Check TP15,16  
Check if there is  
Any Major Difference or not  
Refer to Graph 4.3.3



## 4. TROUBLE SHOOTING

### (4) Checking TX I/Q

#### TEST POINT

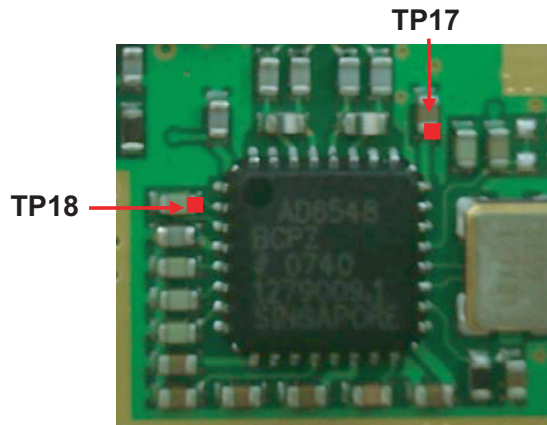
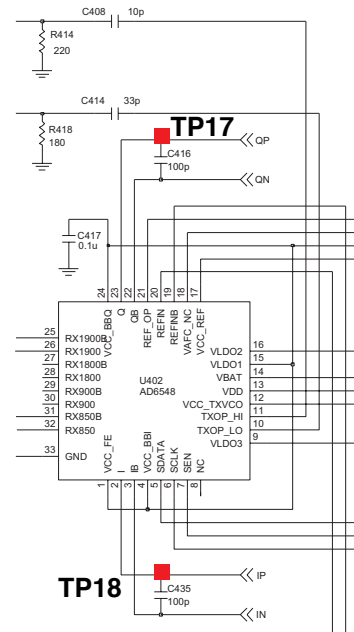
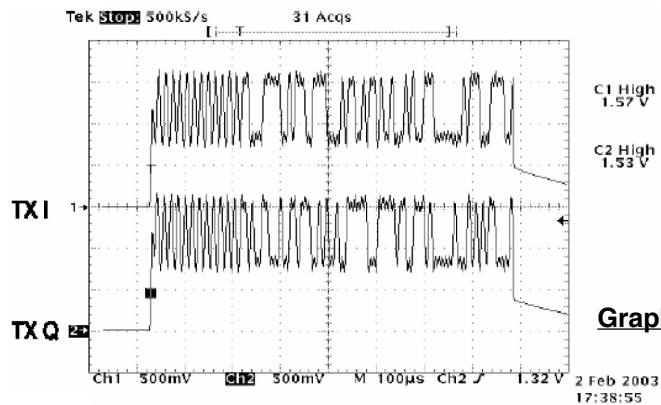


Figure 4.3.4

#### CIRCUIT

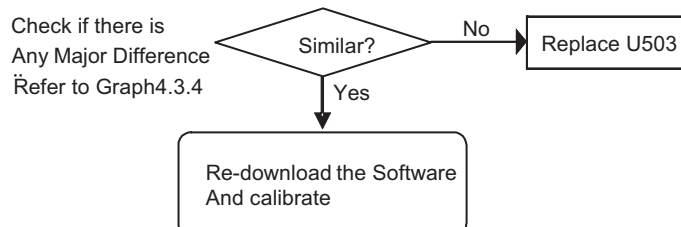


#### WAVEFORM



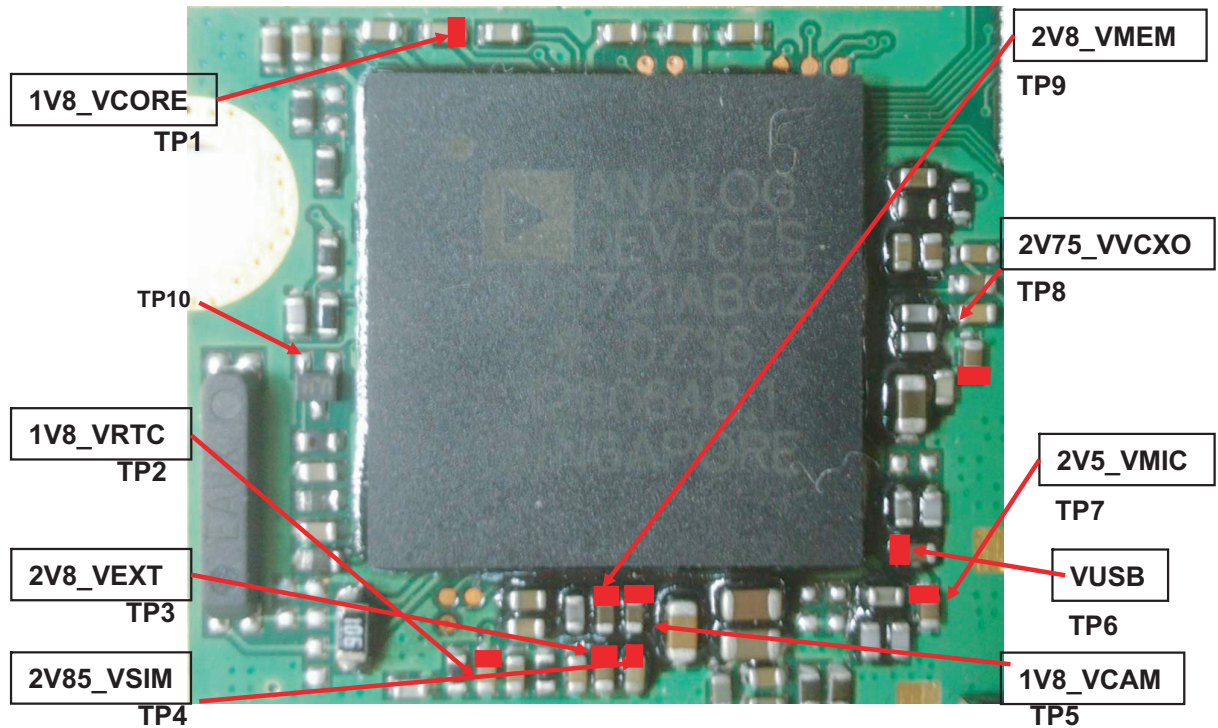
Graph 4.3.4

#### CHECKING FLOW

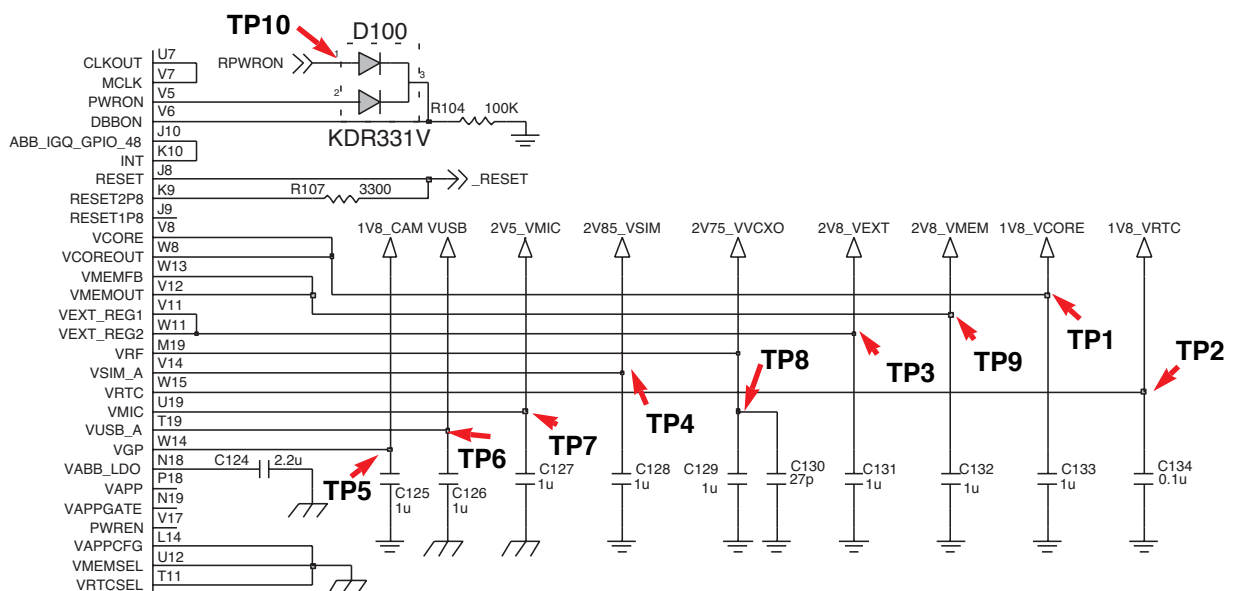


### 4.4 Power On Trouble

#### TEST POINT

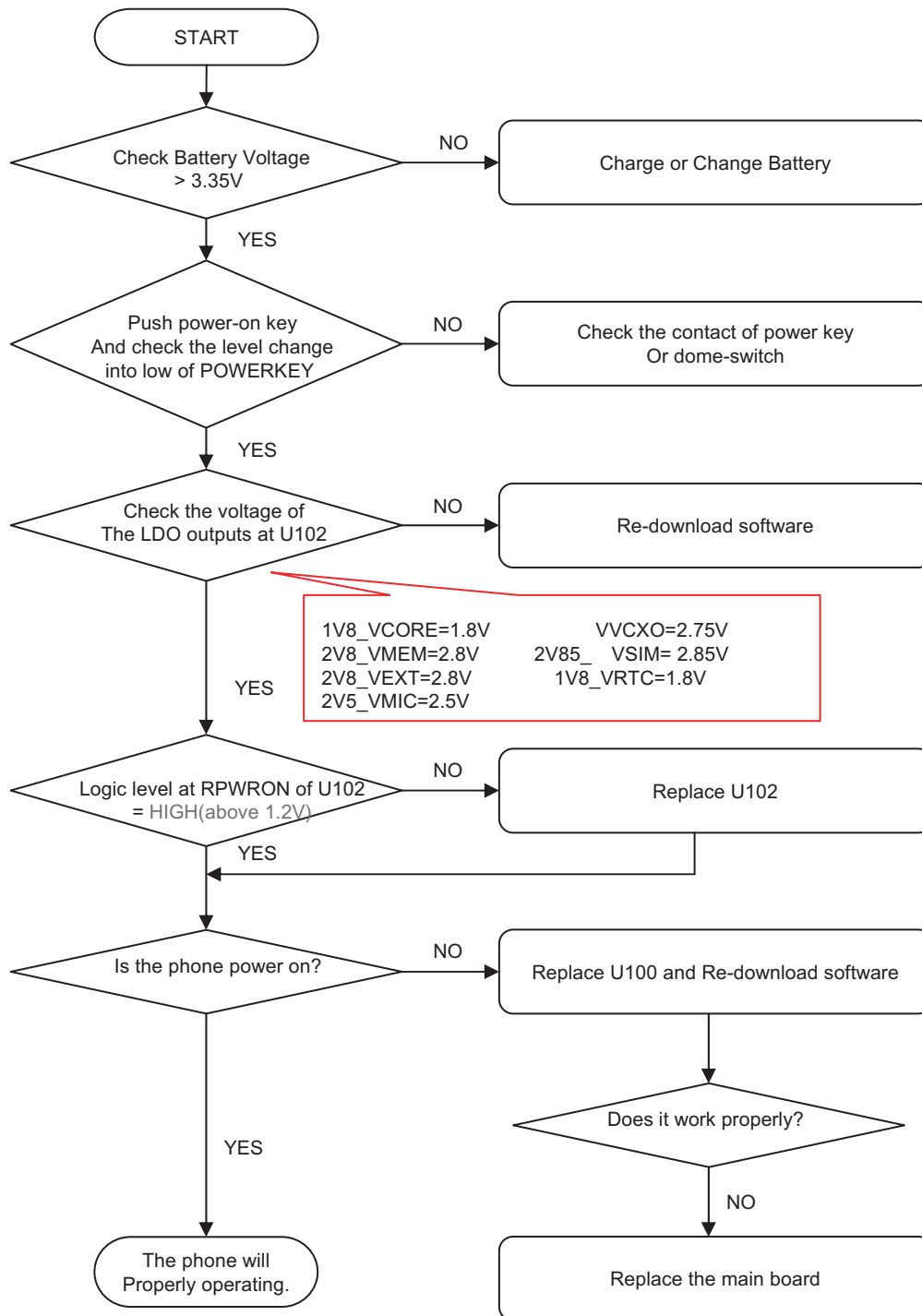


#### CIRCUIT



## 4. TROUBLE SHOOTING

### CHECKING FLOW



### 4.5 Charging Trouble

#### TEST POINT

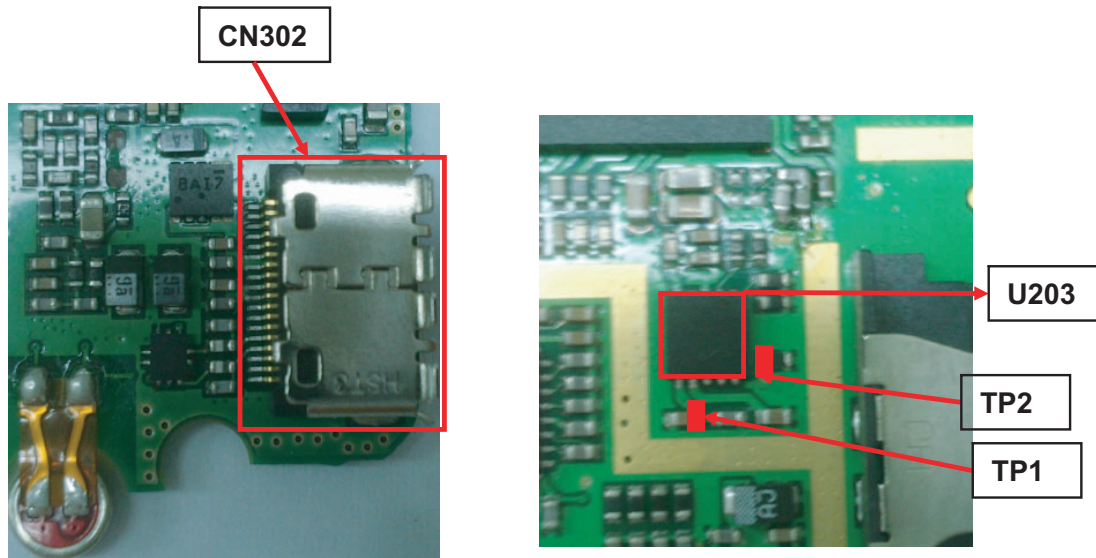
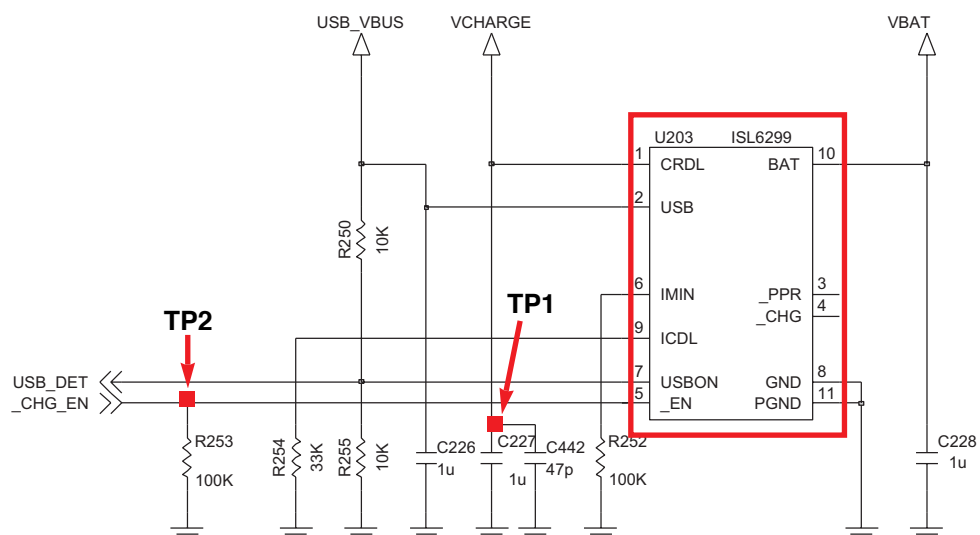


Figure 4.5

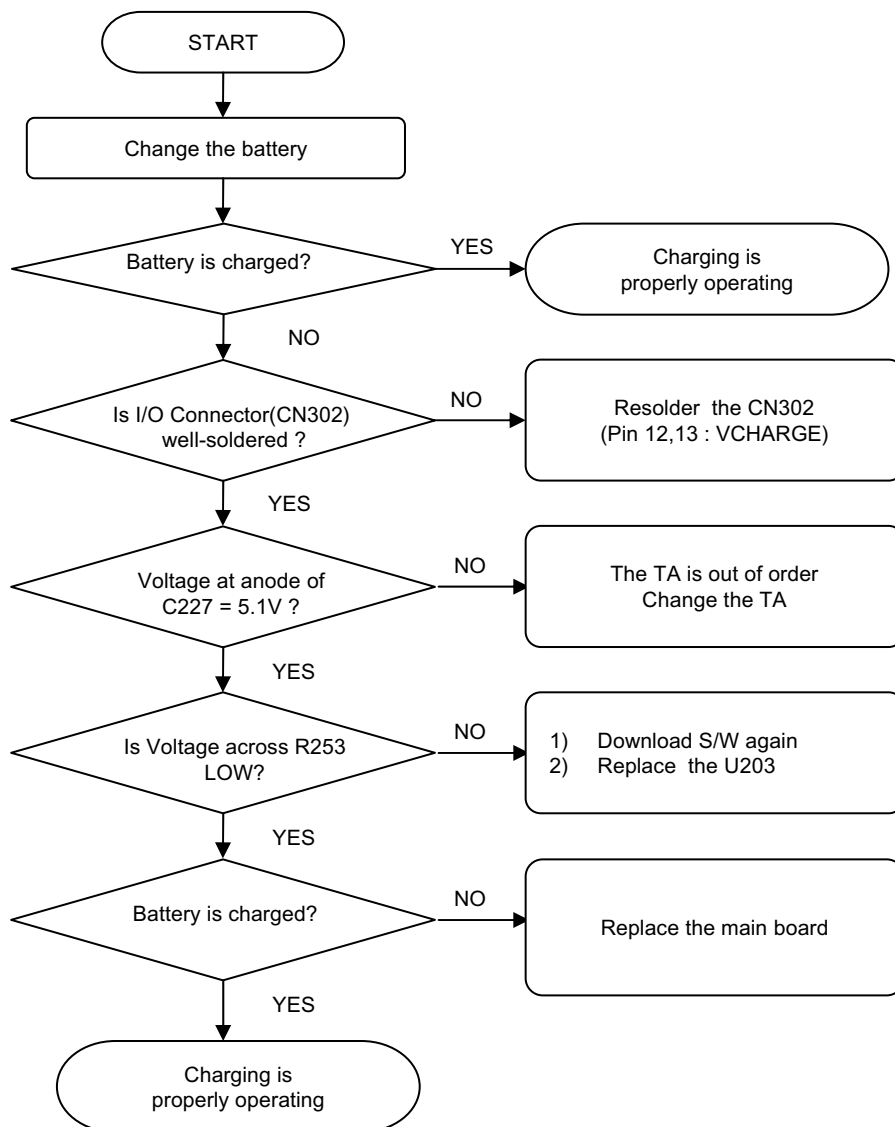
#### CIRCUIT





## 4. TROUBLE SHOOTING

### CHECKING FLOW



### 4.6 Vibrator Trouble

#### TEST POINT

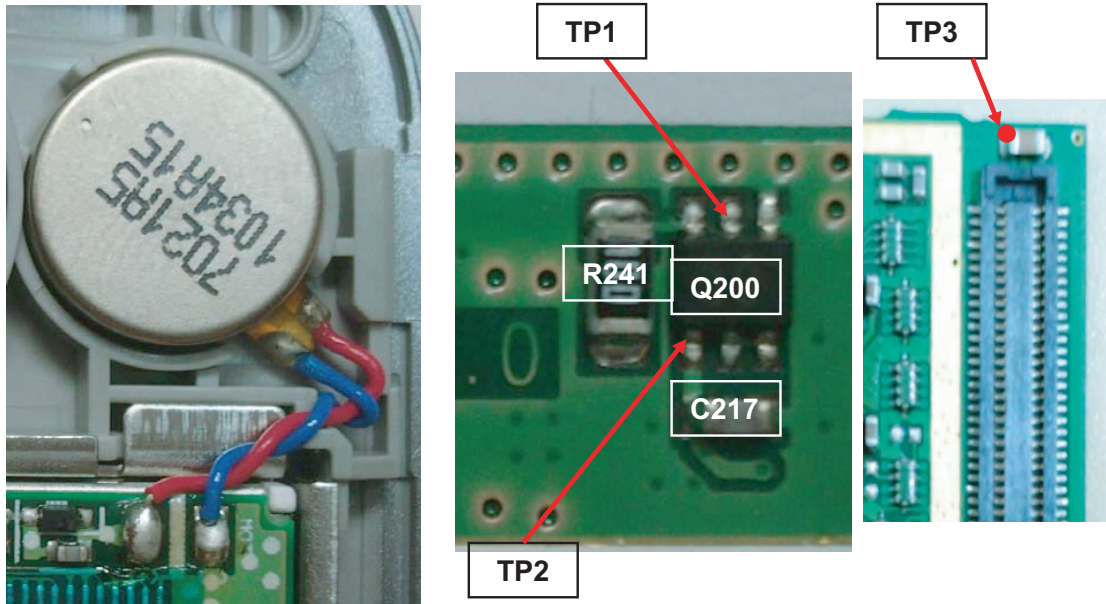
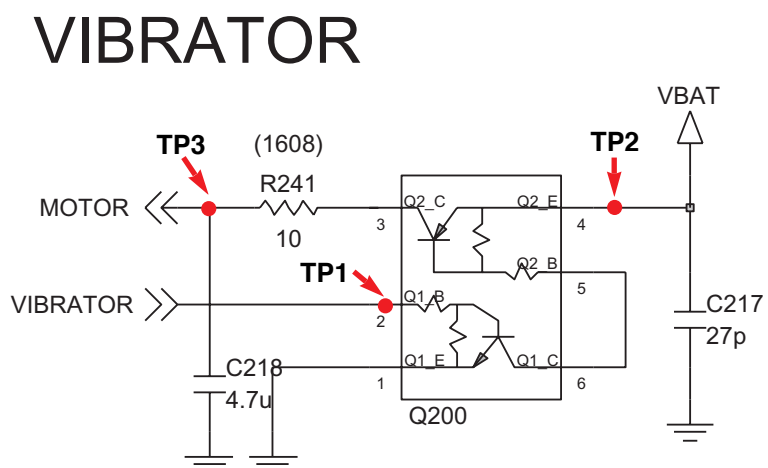


Figure 4.6

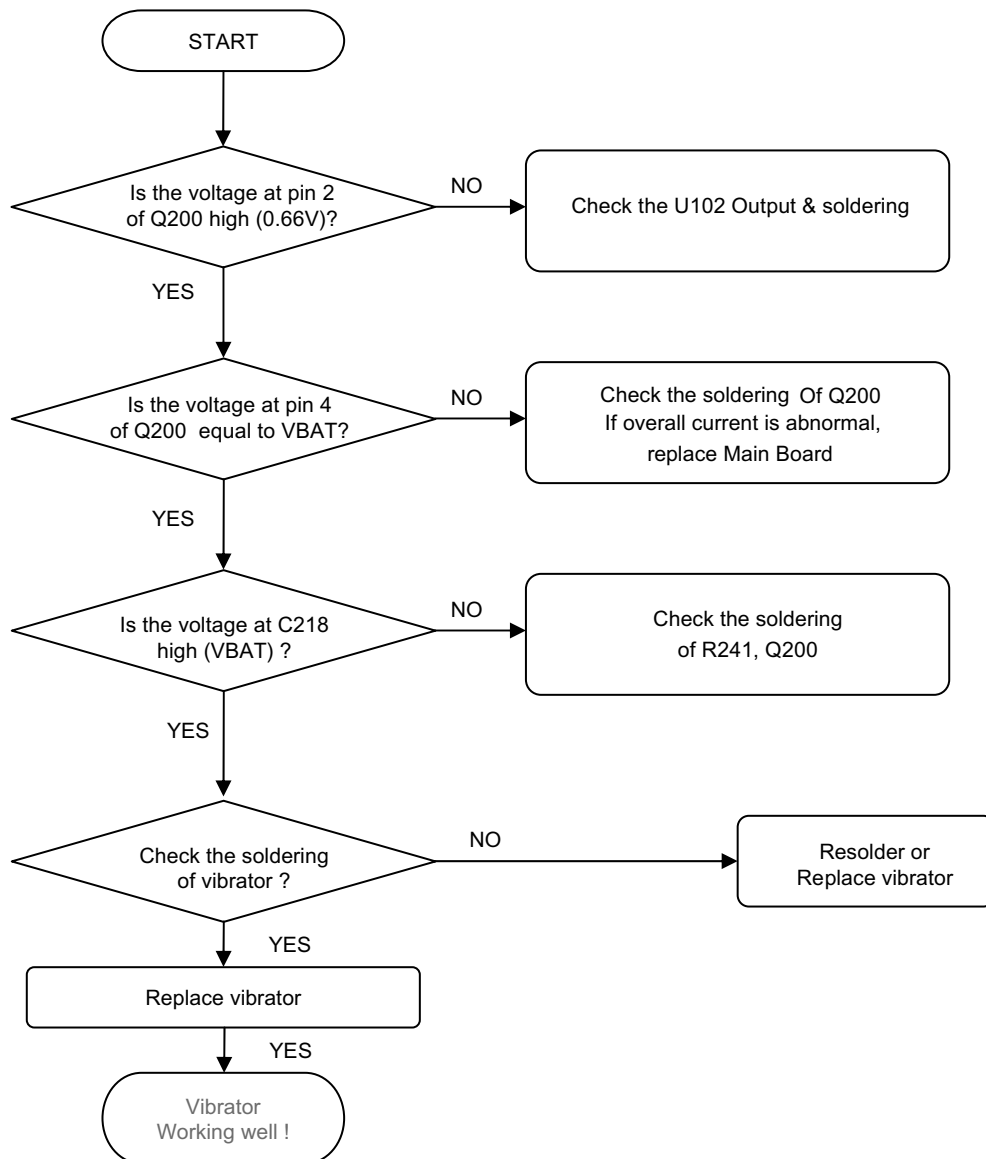
#### CIRCUIT



## 4. TROUBLE SHOOTING

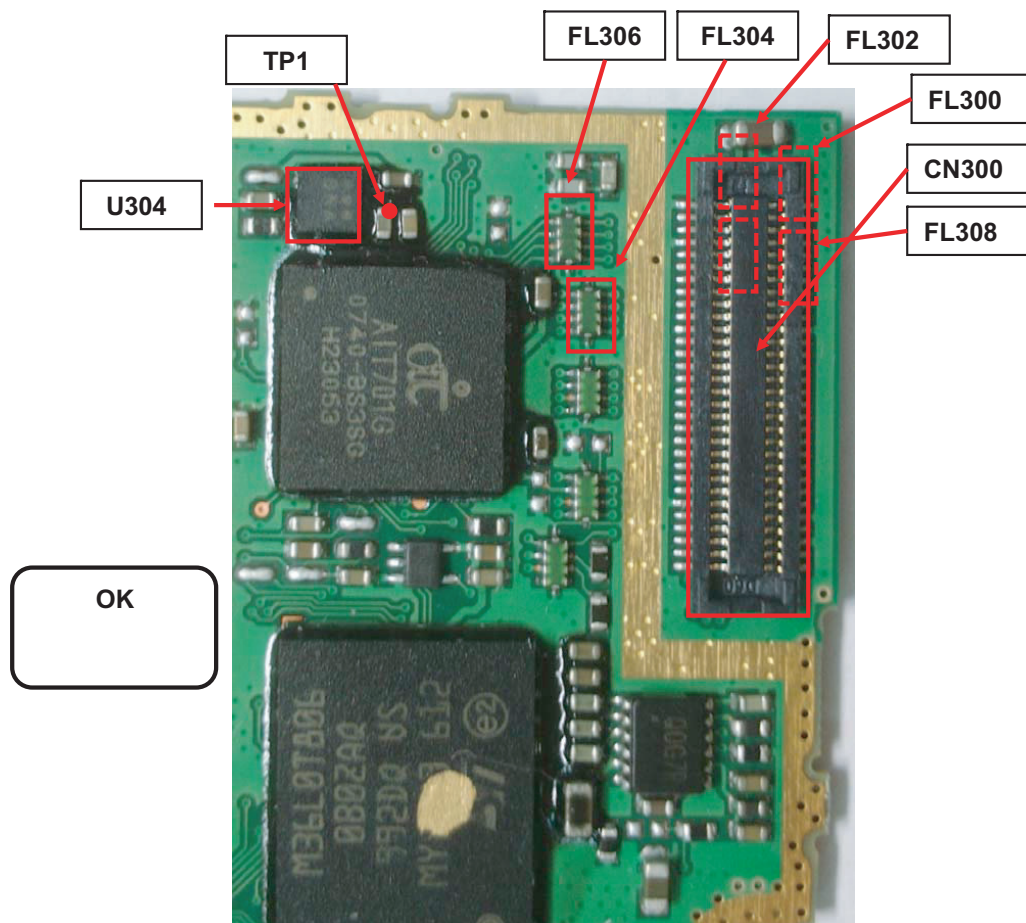
### CHECKING FLOW

SETTING : Enter the engineering mode, and set vibrator on at vibration of BB test menu



### 4.7 LCD Trouble

#### TEST POINT



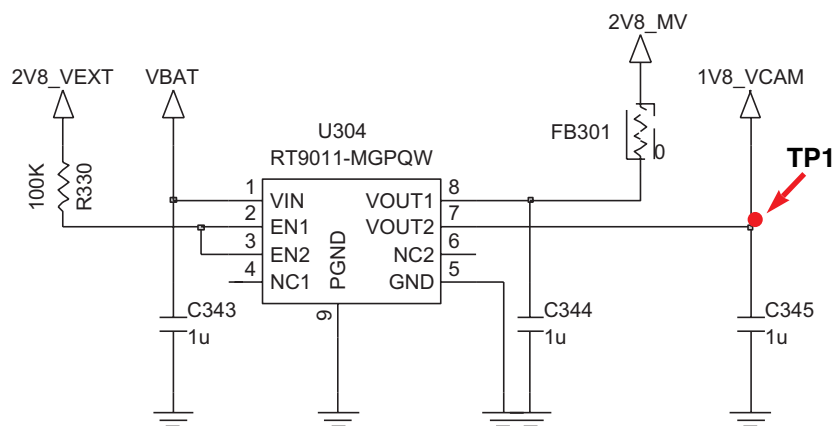
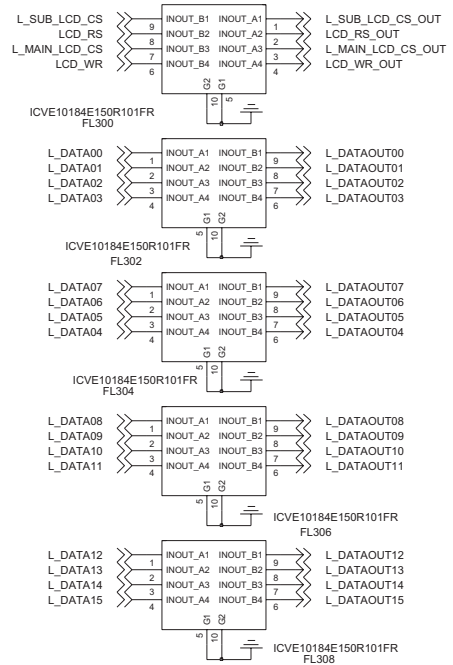
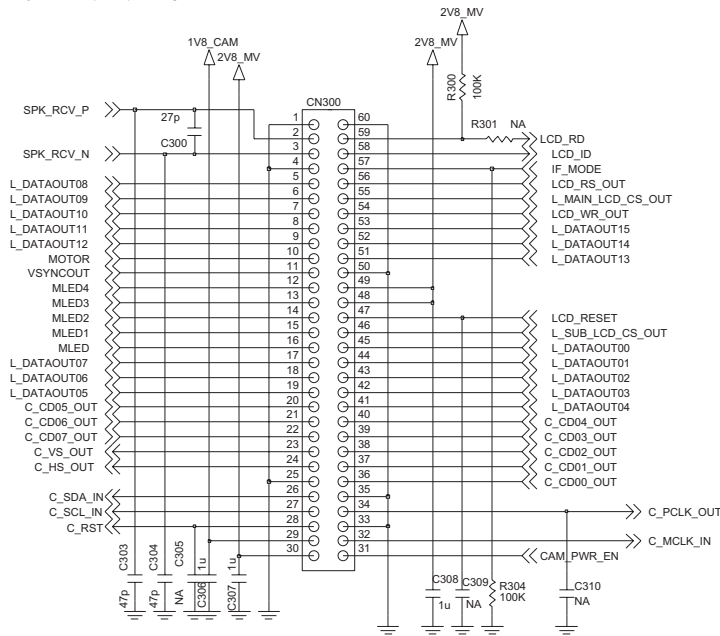
**Figure 4.7**

## 4. TROUBLE SHOOTING

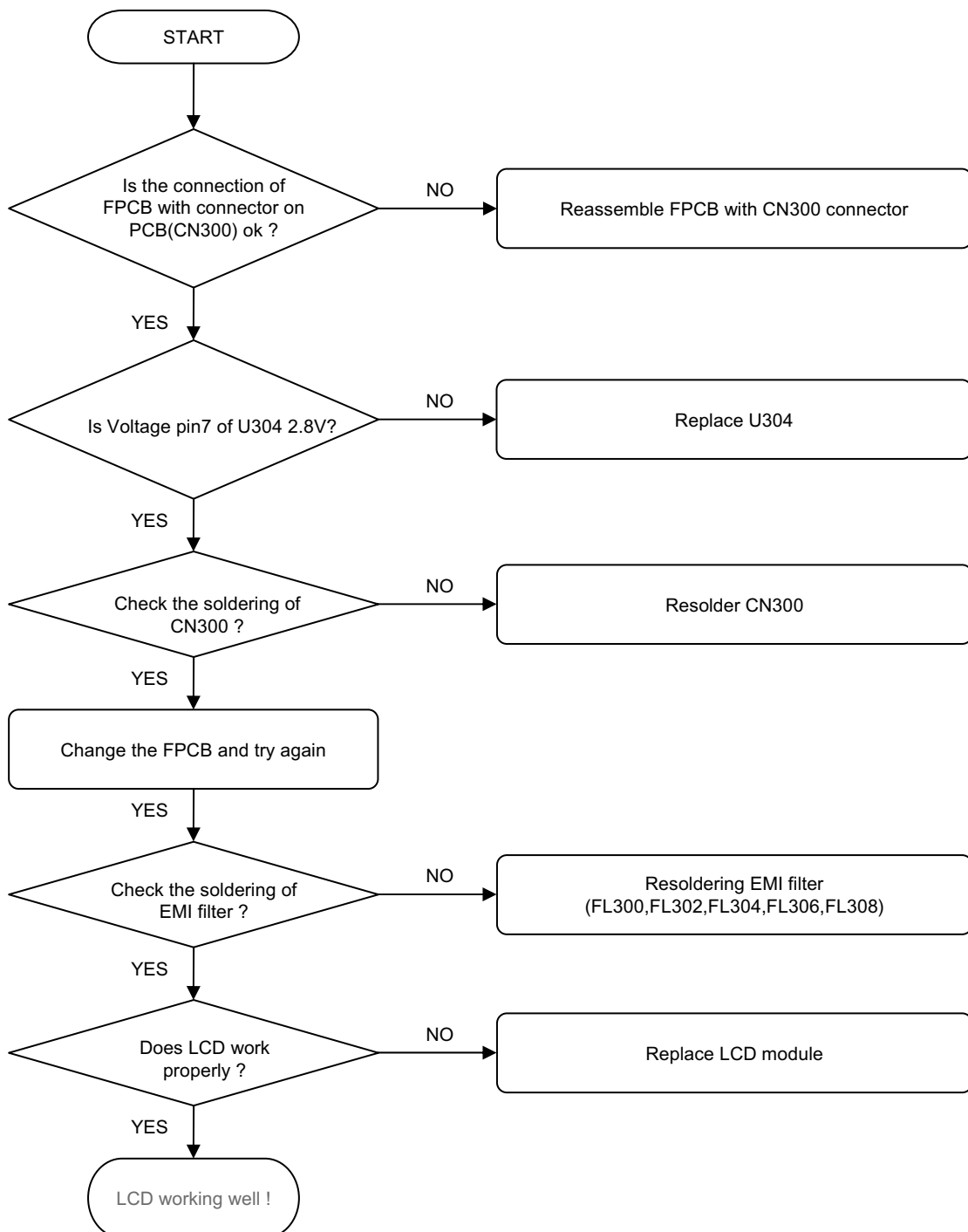
### CIRCUIT

#### MAIN 262K TFT(128\*160)\_SUB CSTN(96\*64) LCD

[Rev.C] Main FPCB pin Map is changed



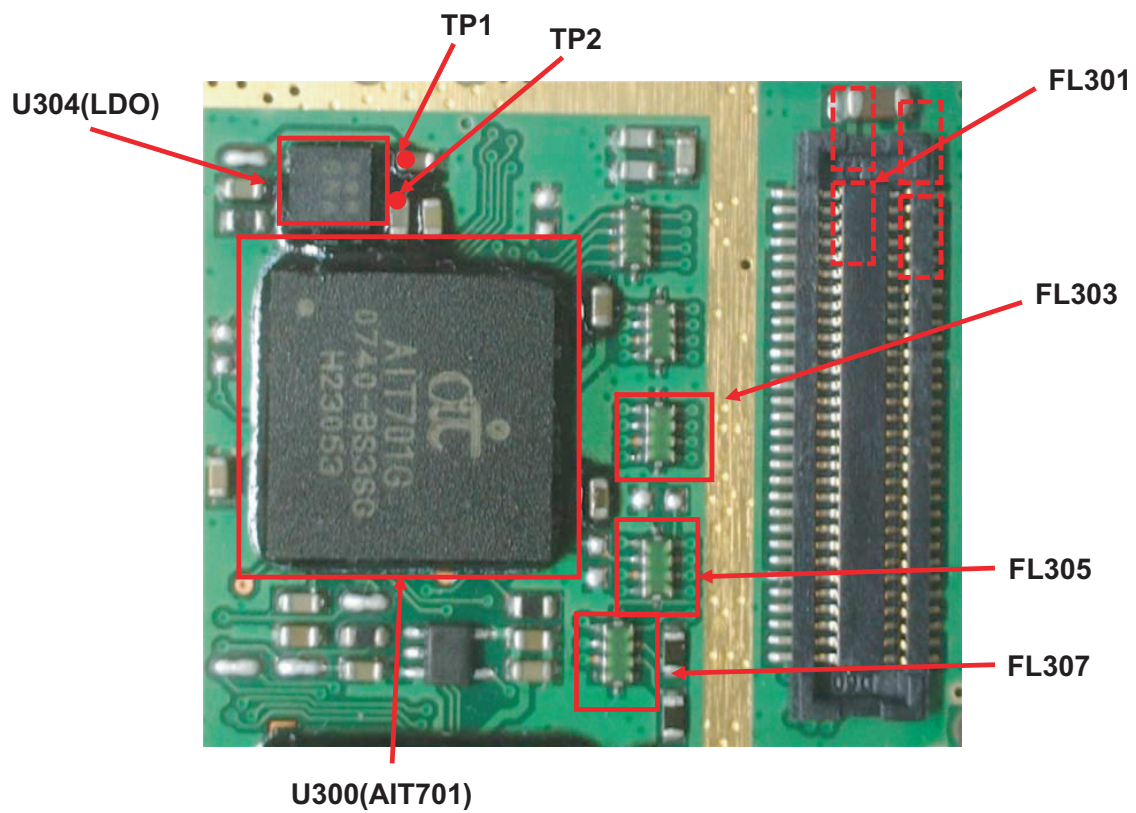
### CHECKING FLOW



## 4. TROUBLE SHOOTING

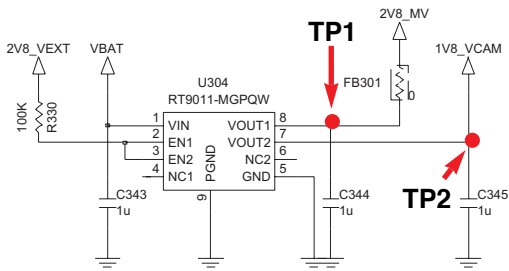
### 4.8 Camera Trouble

#### TEST POINT



**Figure 4.8**

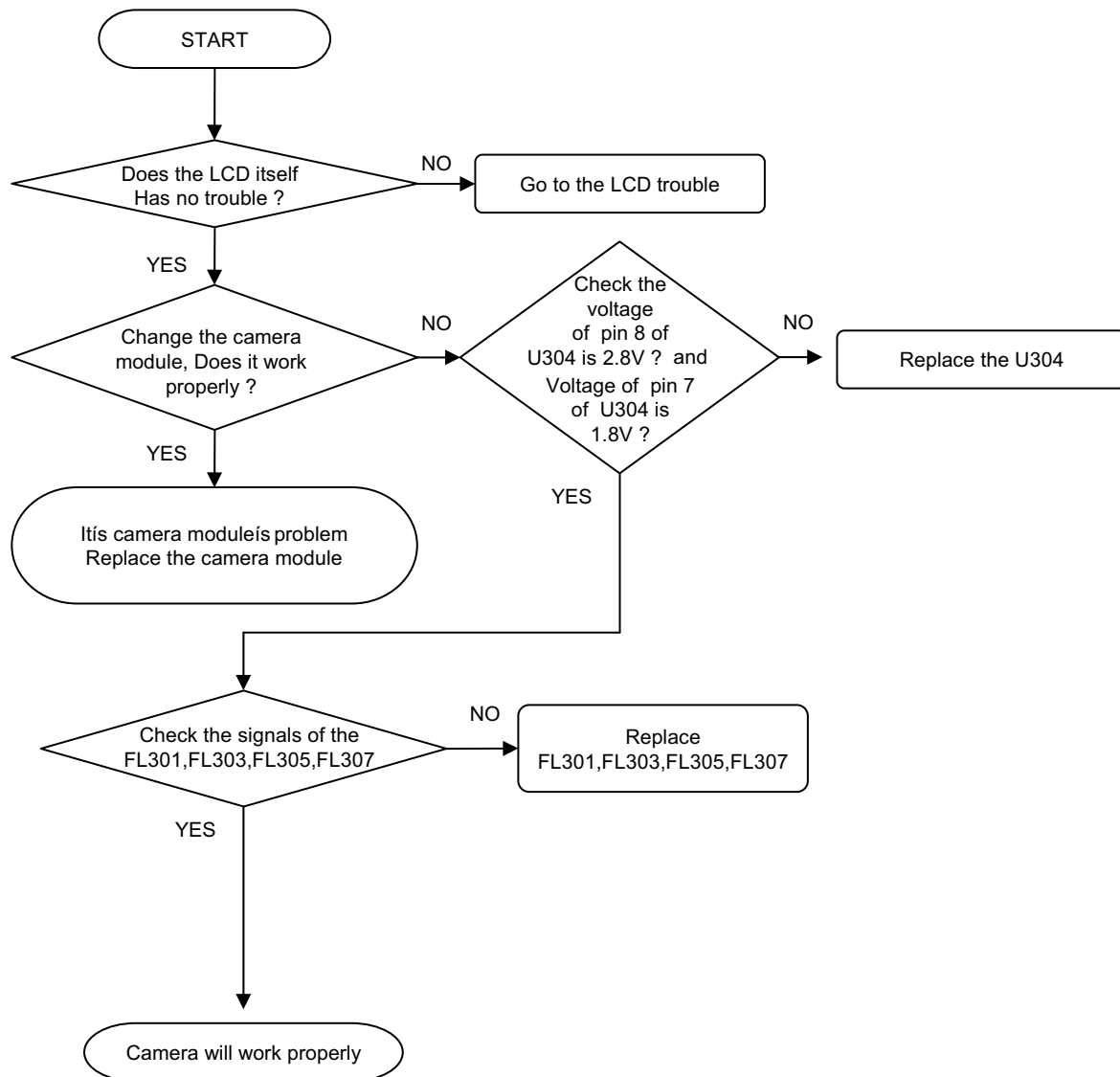
## CIRCUIT





## 4. TROUBLE SHOOTING

### CHECKING FLOW



### 4.9 Speaker Trouble

#### TEST POINT

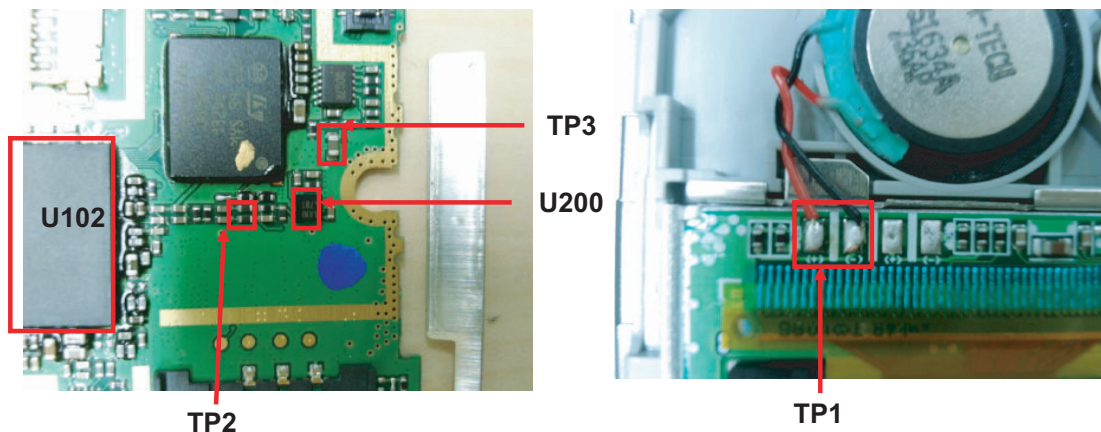
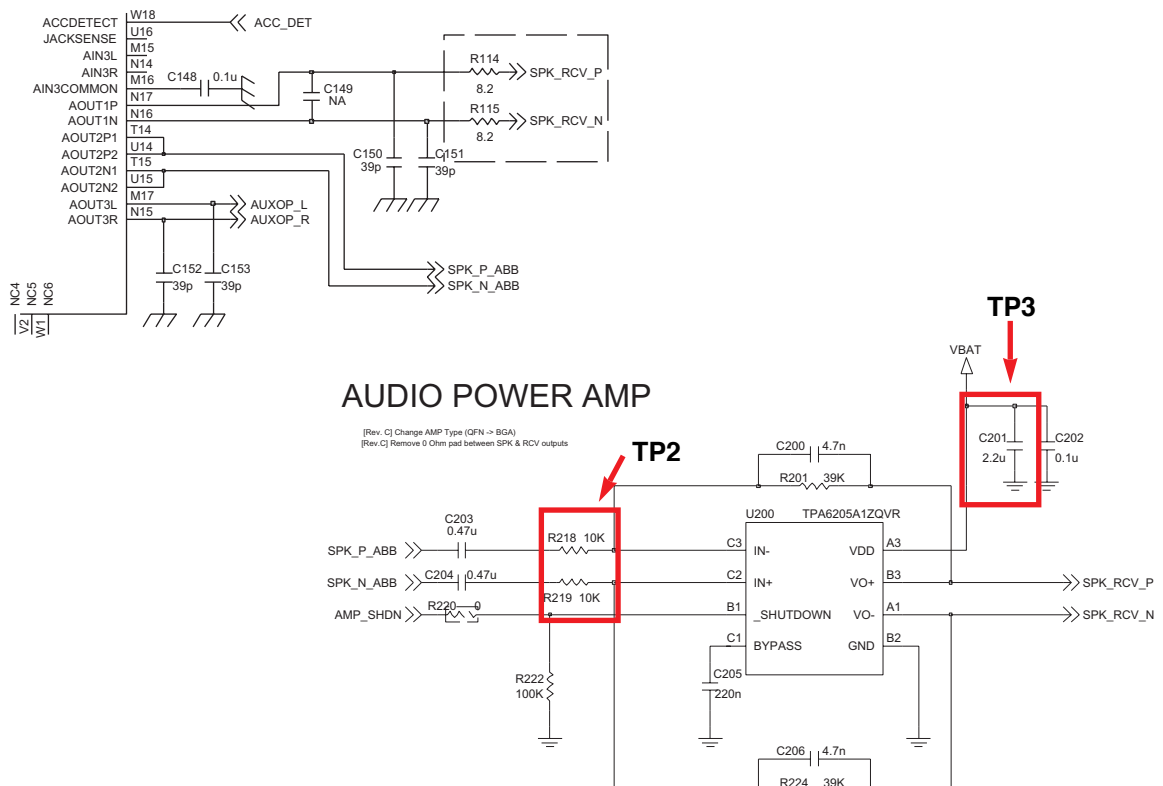


Figure 4.9

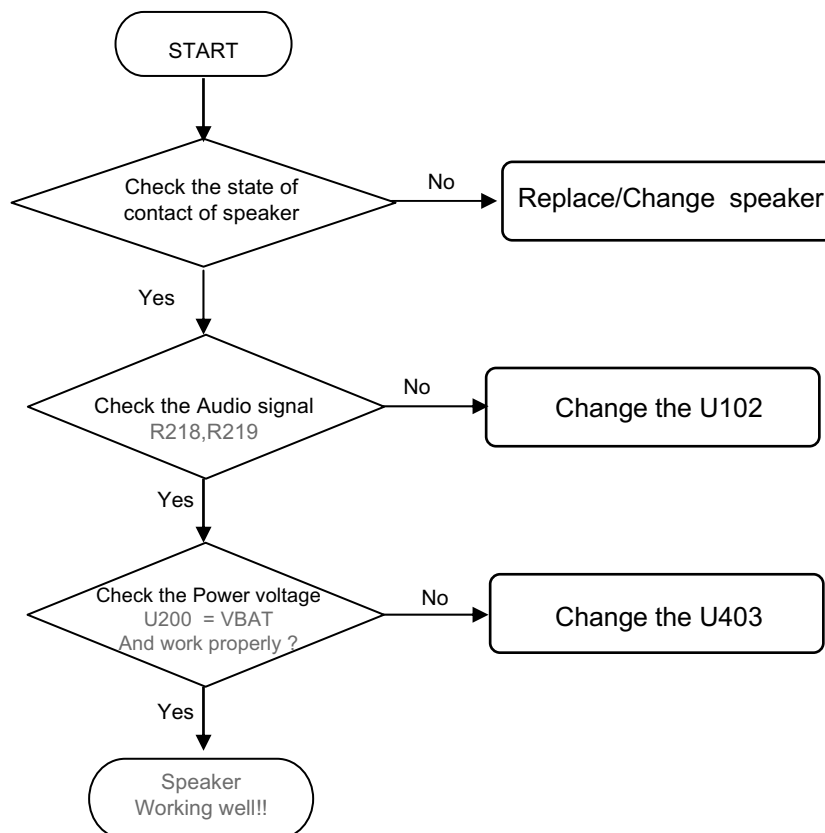
#### CIRCUIT



## 4. TROUBLE SHOOTING

---

### CHECKING FLOW



### 4.10 SIM Card Interface Trouble

#### TEST POINT

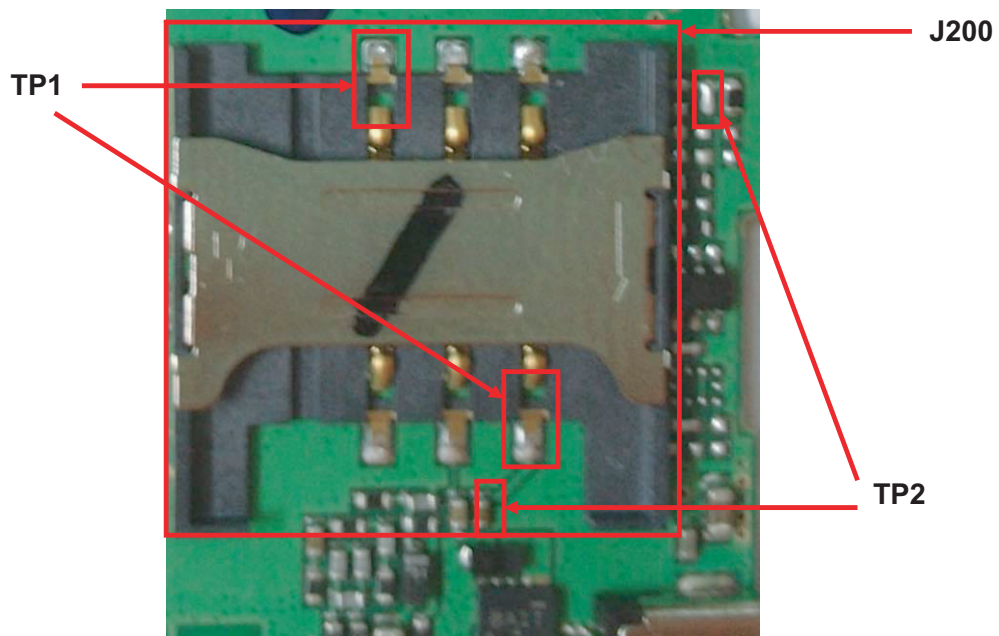
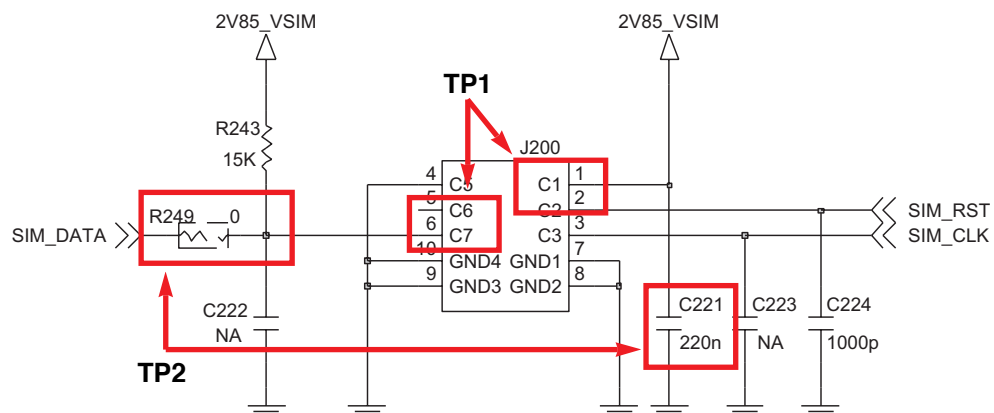


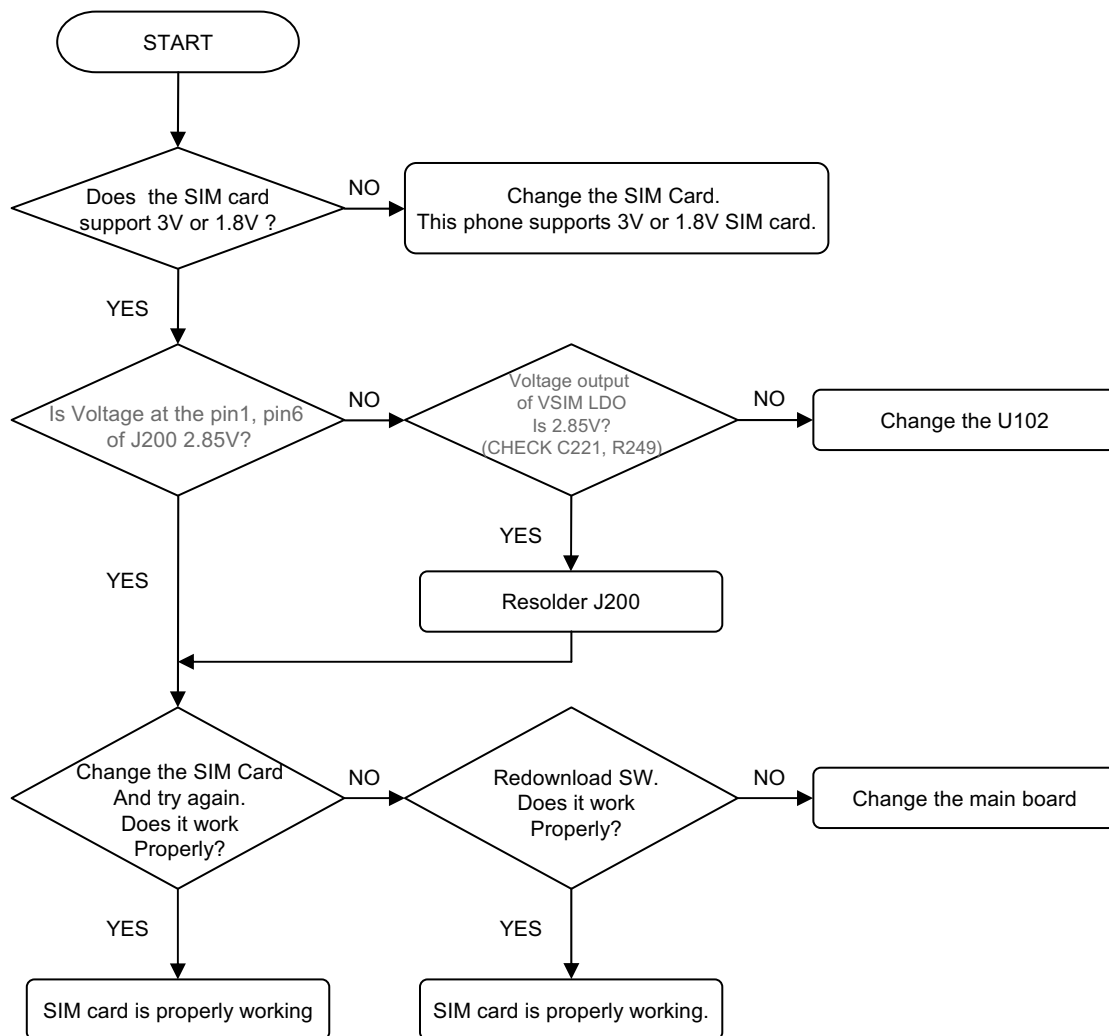
Figure 4.10

#### CIRCUIT



## 4. TROUBLE SHOOTING

### CHECKING FLOW



## 4. TROUBLE SHOOTING

### 4.11 Earphone Trouble

#### TEST POINT

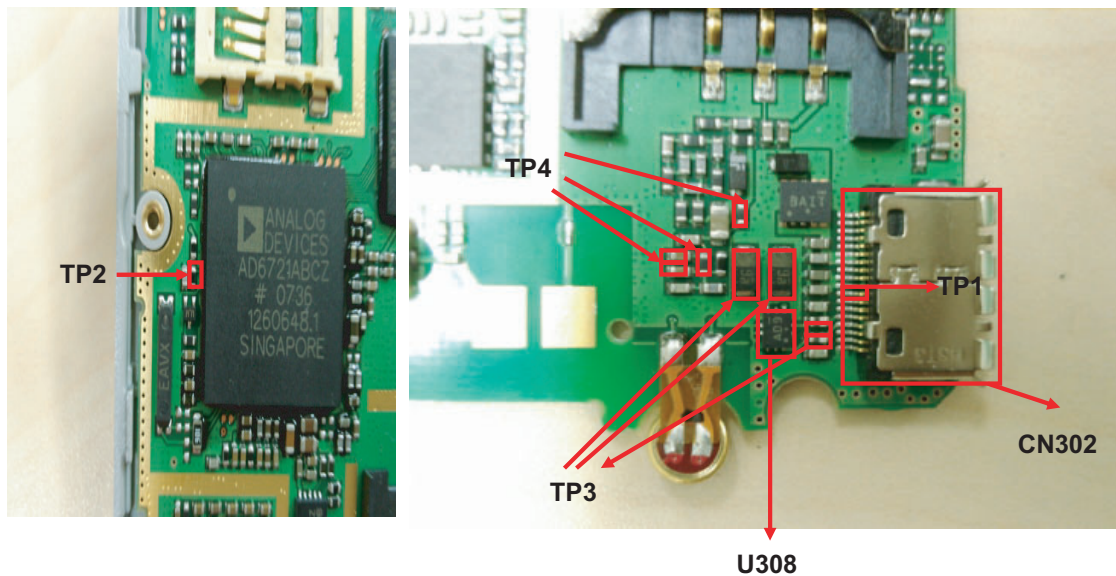
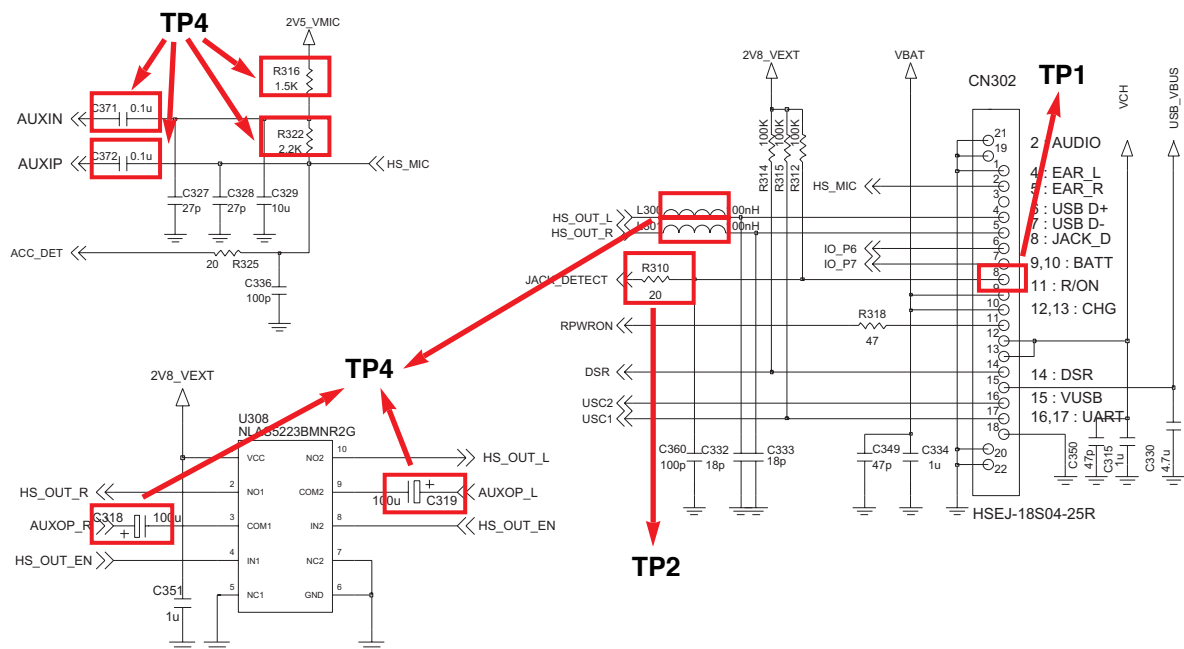


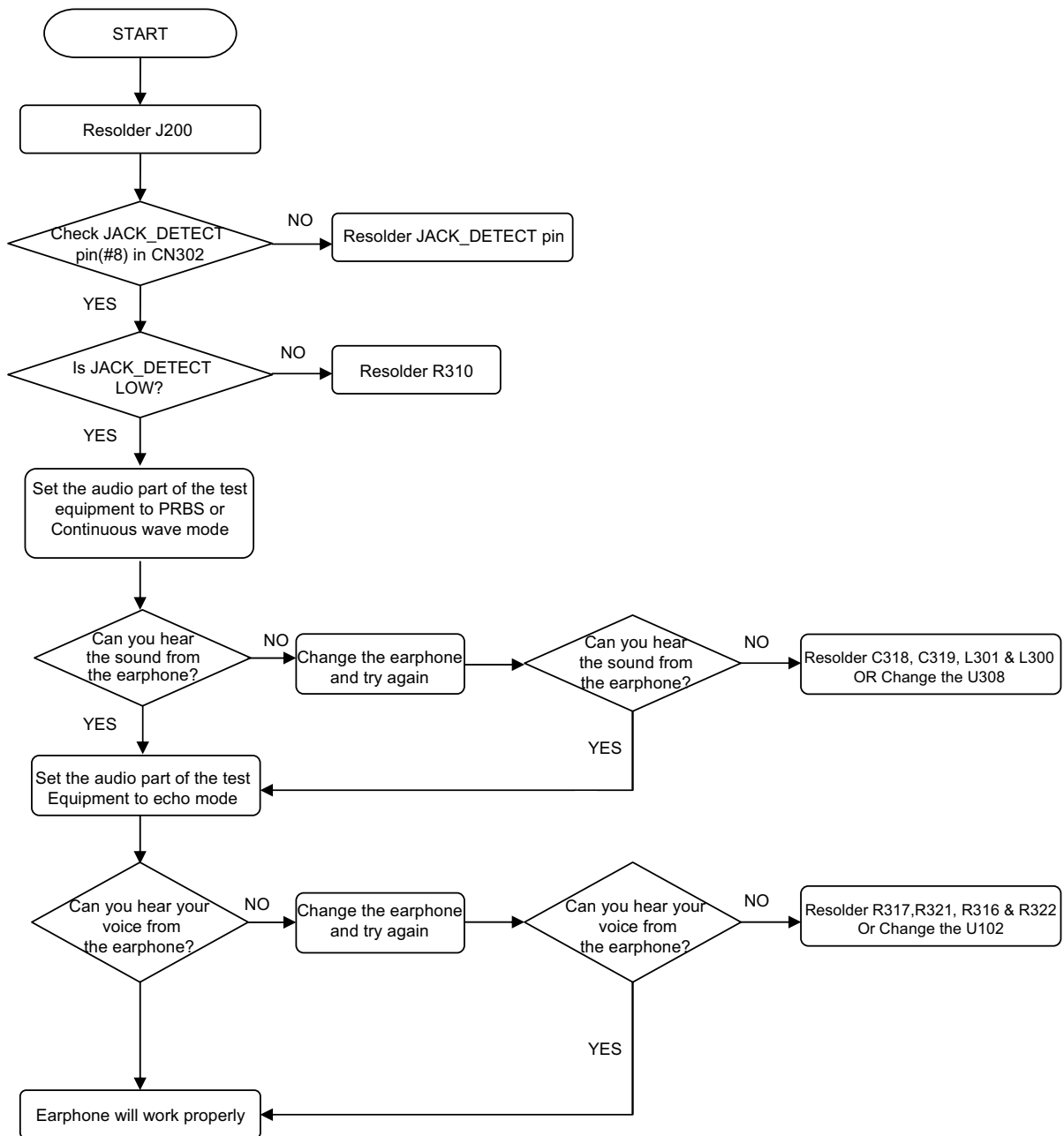
Figure 4.11

#### CIRCUIT



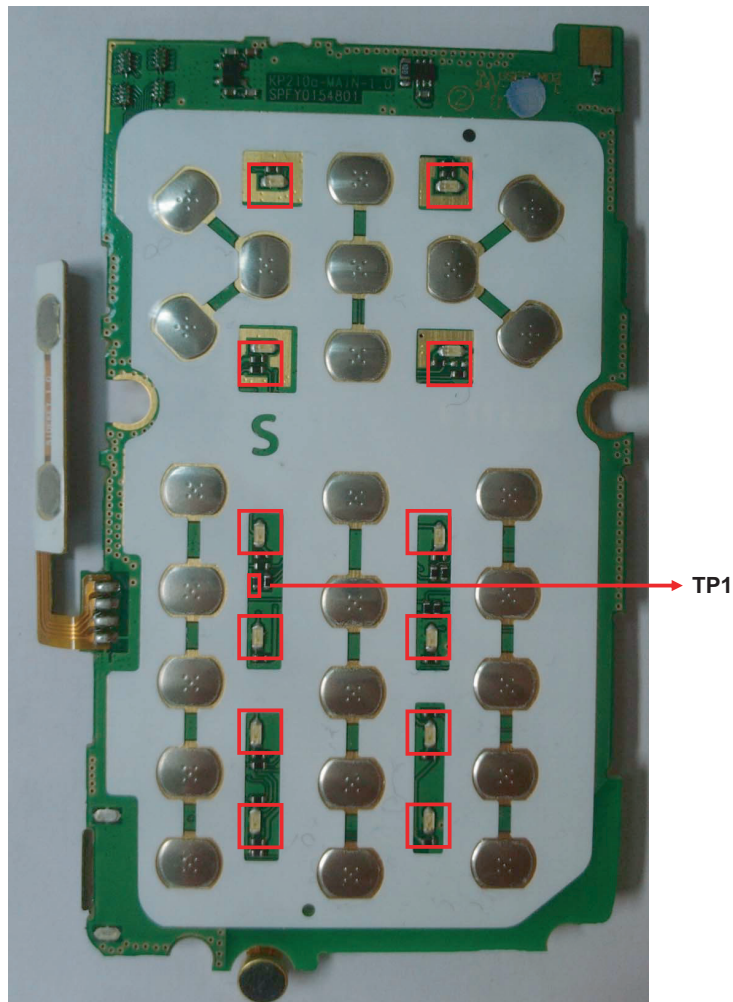
## 4. TROUBLE SHOOTING

### CHECKING FLOW



### 4.12 KEY backlight Trouble

#### TEST POINT

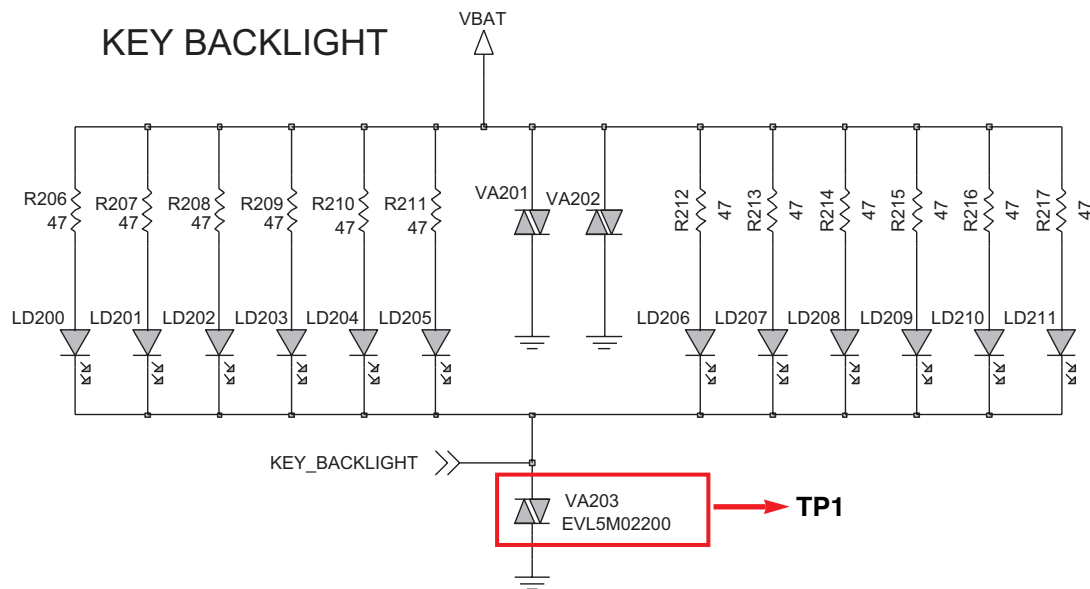


**Figure 4.12**

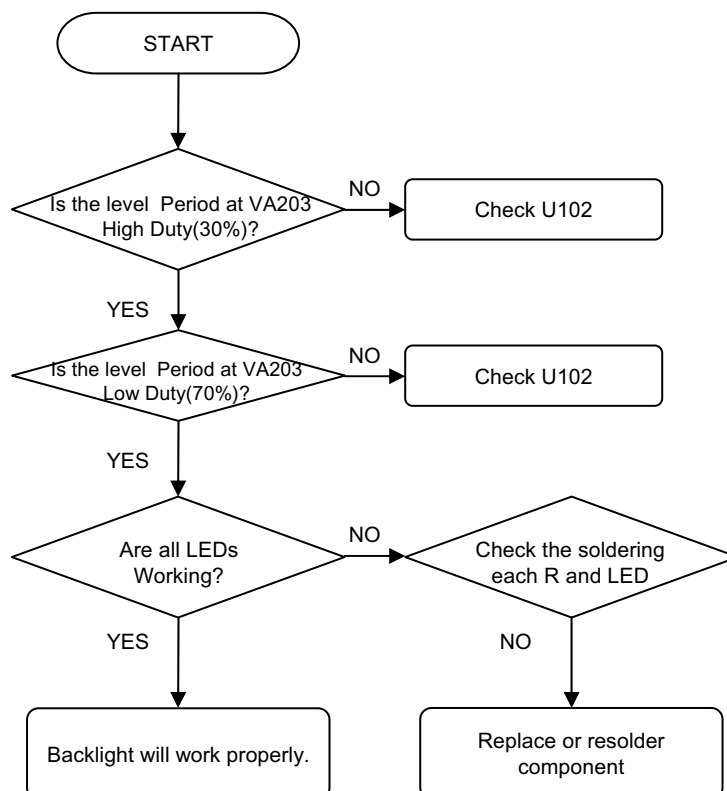


## 4. TROUBLE SHOOTING

### CIRCUIT



### CHECKING FLOW



### 4.13 Receiver Trouble

#### TEST POINT

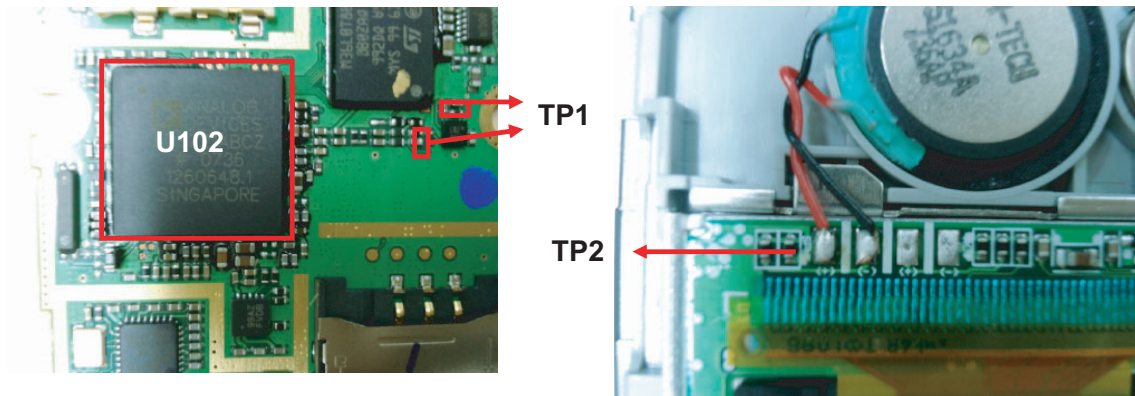
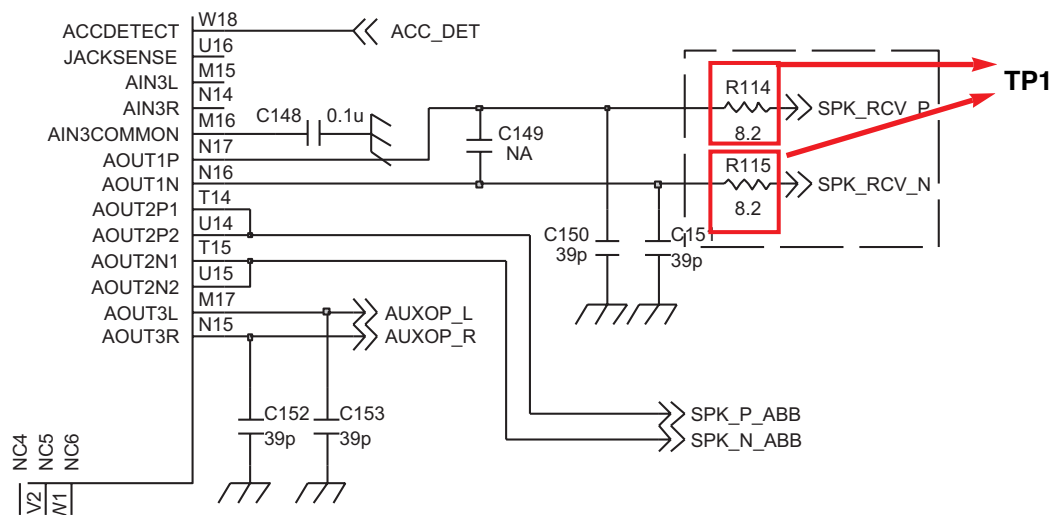


Figure 4.13

#### TEST POINT



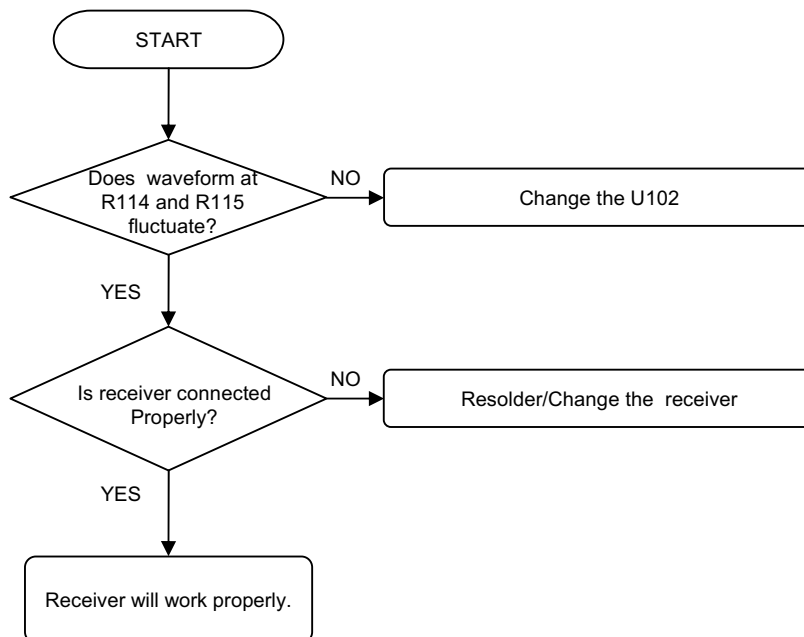
## 4. TROUBLE SHOOTING

---

### CHECKING FLOW

SETTING : After initialize Agilent 8960, Test GSM850, PCS mode

Set the property of audio as PRBS or continuous wave. Set the receiving volume of mobile as Max.



### 4.14 Microphone Trouble

#### TEST POINT

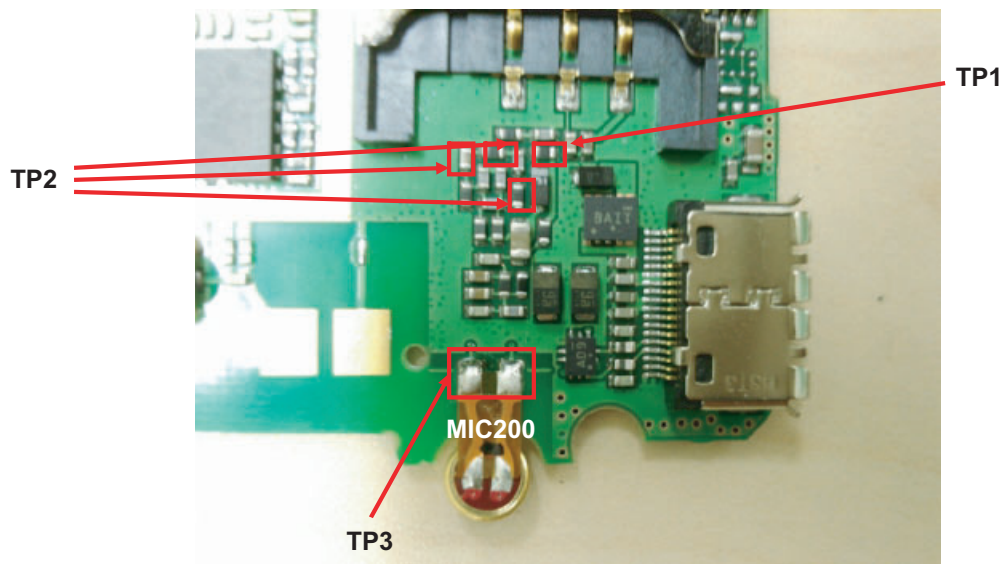
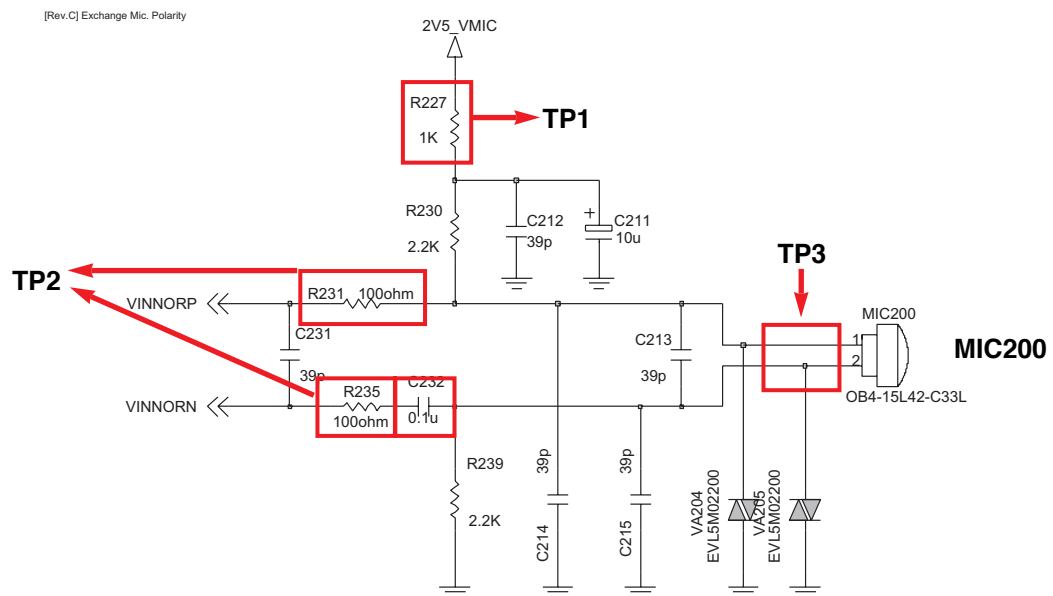


Figure 4.14

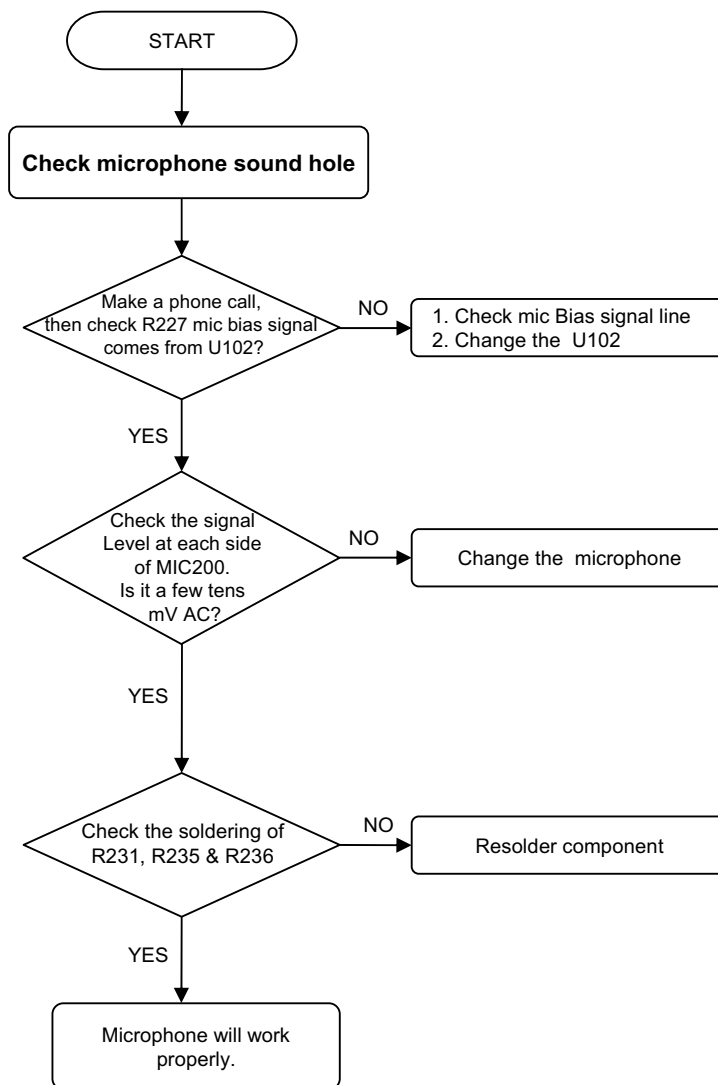
#### CIRCUIT



## 4. TROUBLE SHOOTING

### CHECKING FLOW

SETTING : After initialize Agilent 8960, Test GSM850, PCS mode



### 4.15 RTC Trouble

#### TEST POINT

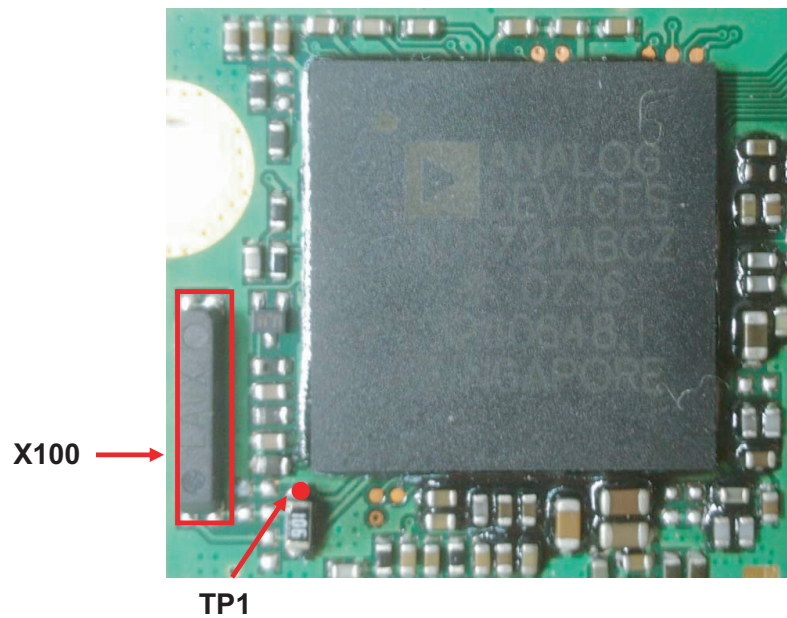
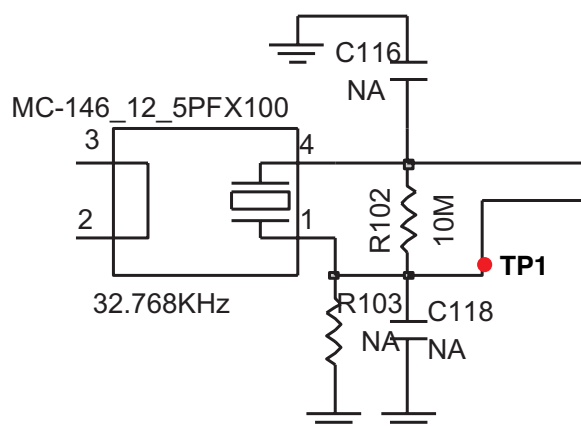


Figure 4.15

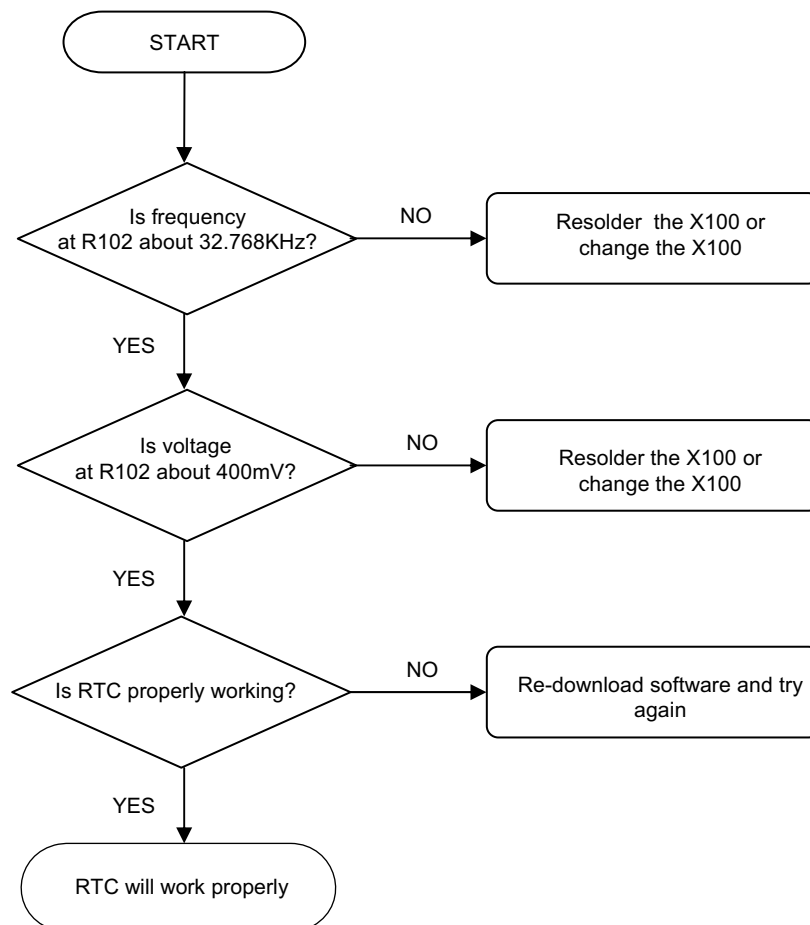
#### CIRCUIT



## 4. TROUBLE SHOOTING

---

### CHECK FLOW



### 4.16 Folder on/off Trouble

#### TEST POINT

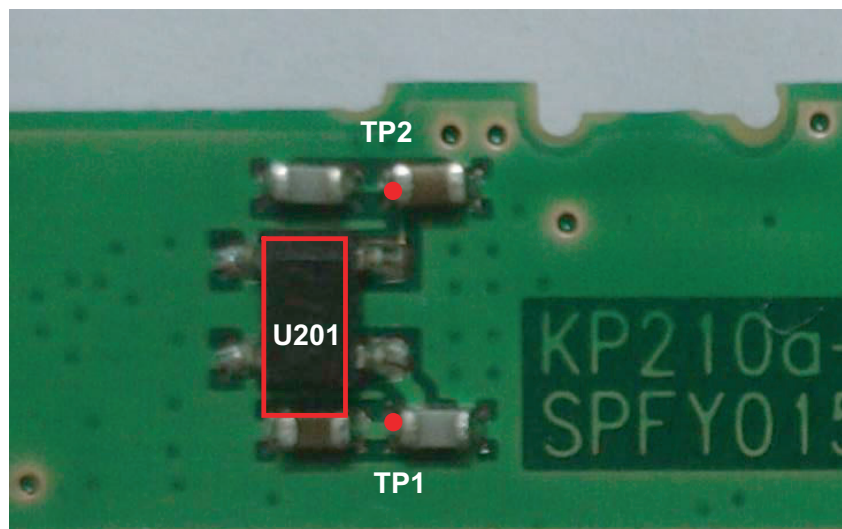
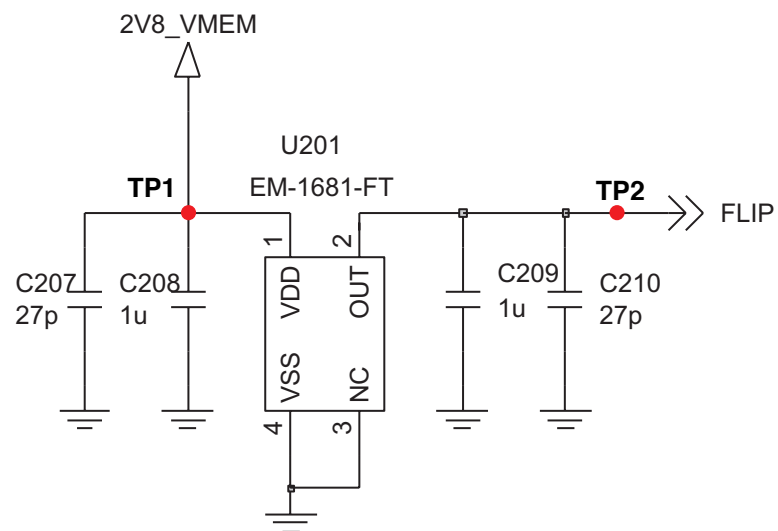


Figure 4.16

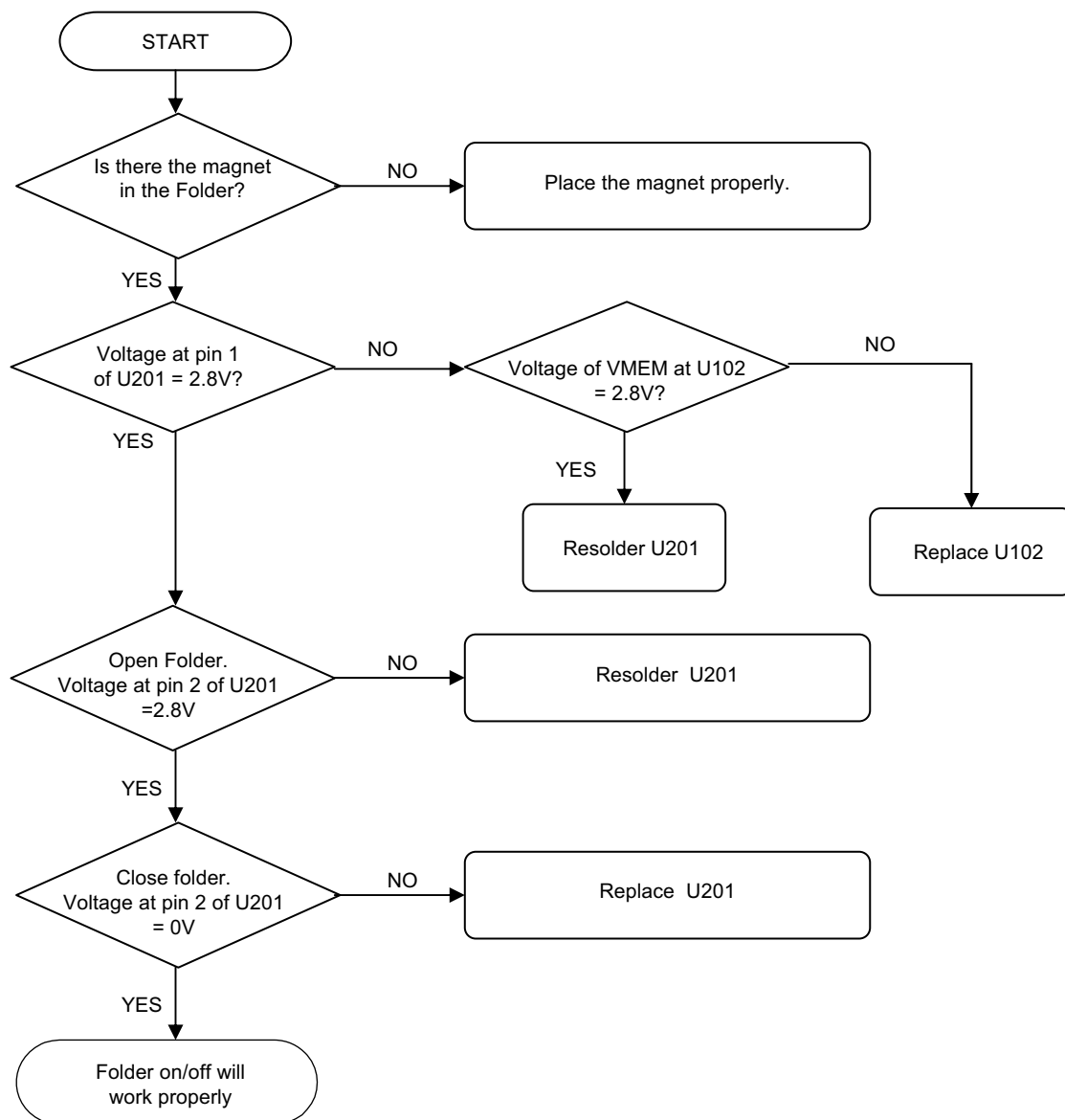
#### CIRCUIT





## 4. TROUBLE SHOOTING

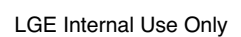
### CHECKING FLOW



### TEST POINT

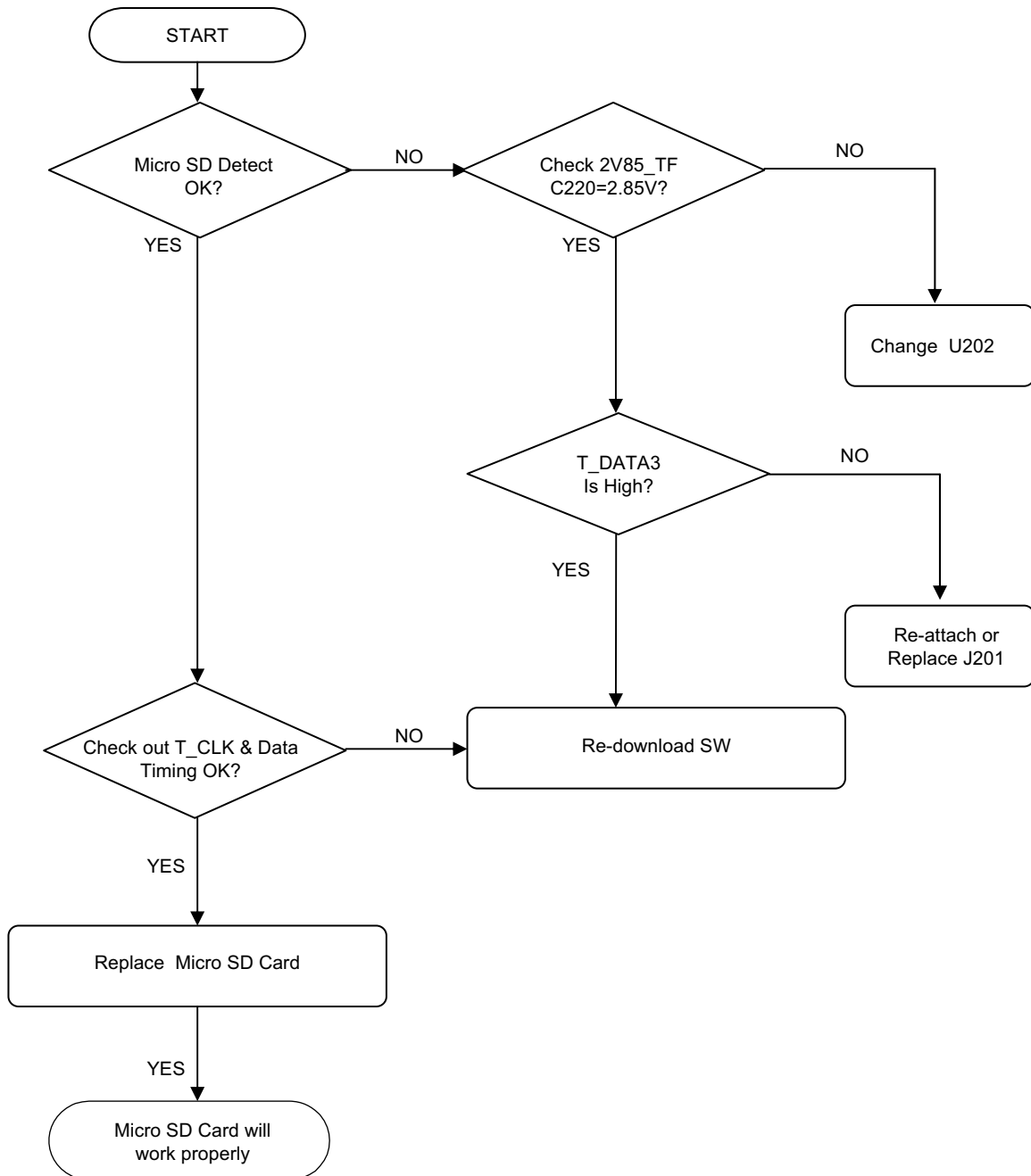


## CIRCUIT



## 4. TROUBLE SHOOTING

### CHECKING FLOW

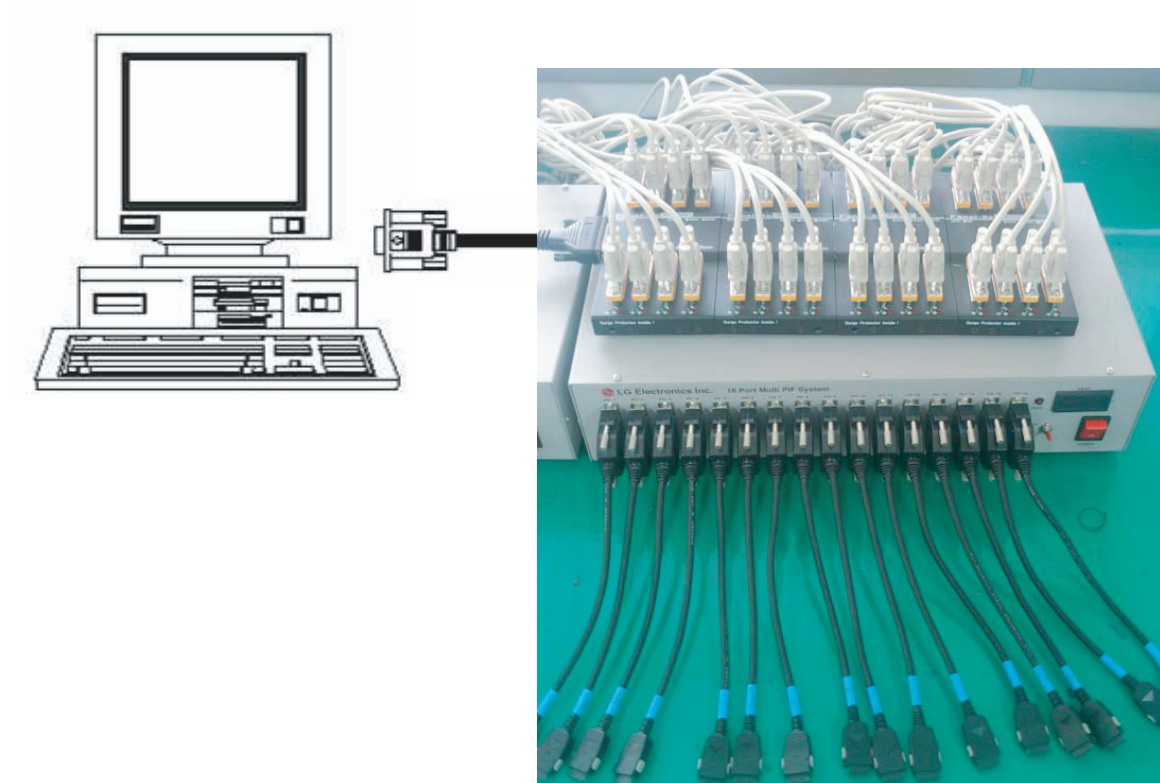


## 5. DOWNLOAD

### 5.1 Download

#### A. Download Setup

Figure 5.1 describes Download setup

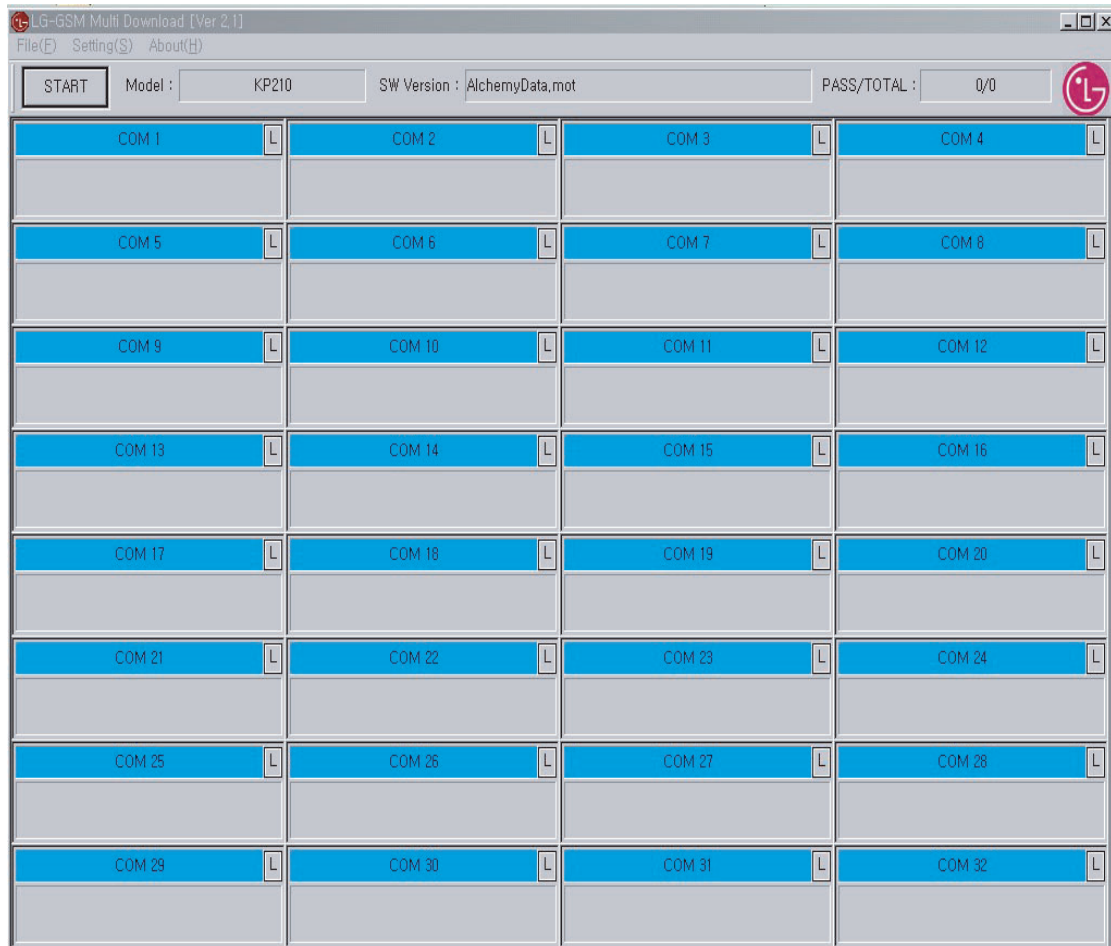


**Figure 5.1 Download Setup**

## 5. DOWNLOAD

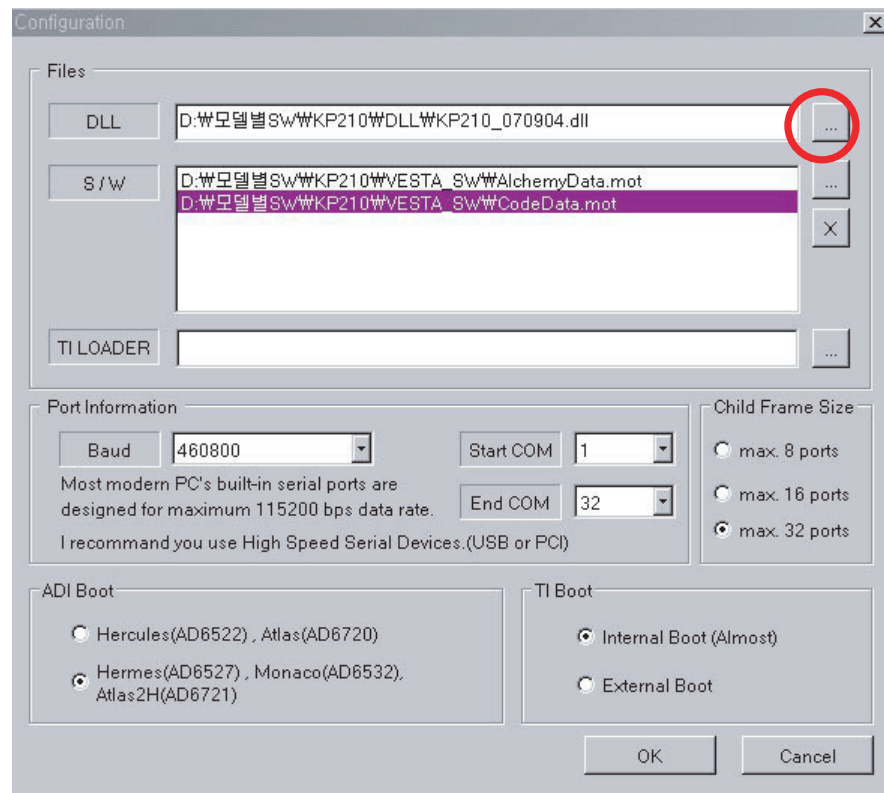
### B. Multi Download Procedure

1. Run GSM Multi Download program and select Setting

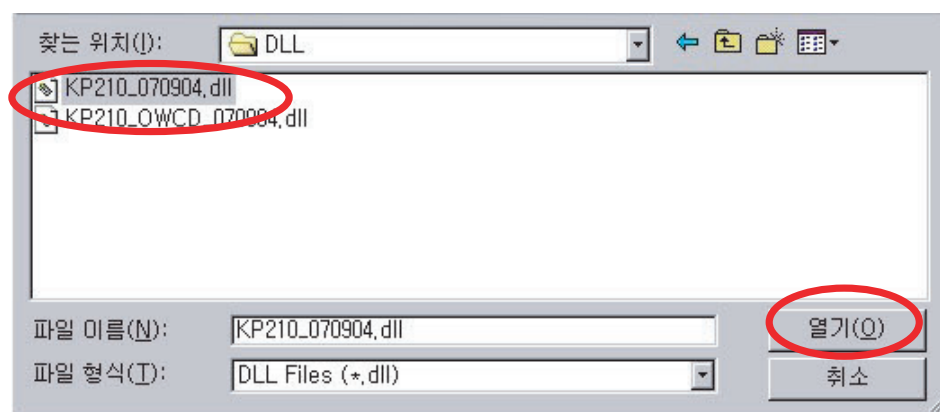


## 5. DOWNLOAD


2. Select Configuration from the menu and you may see this window

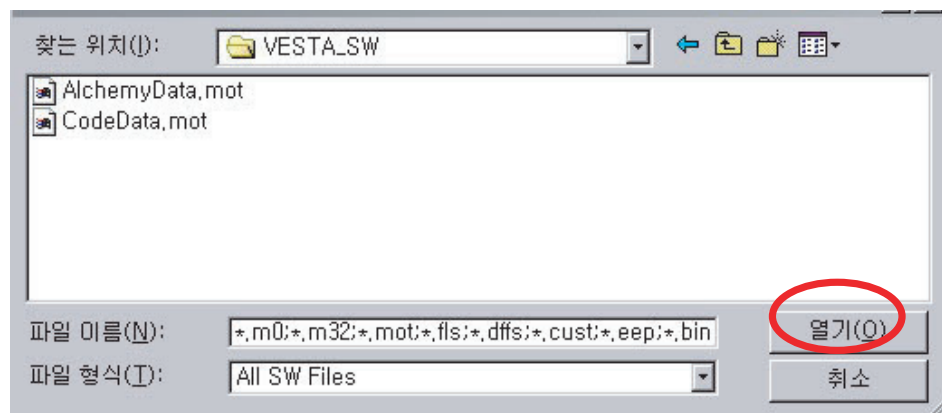
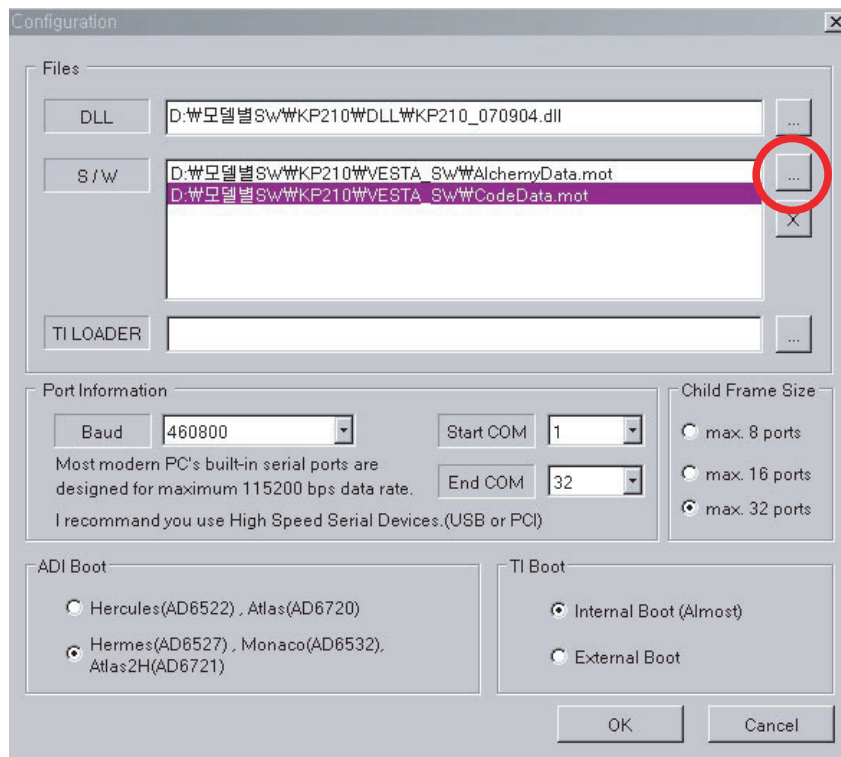


3. Press  key to select DLL file and press Open



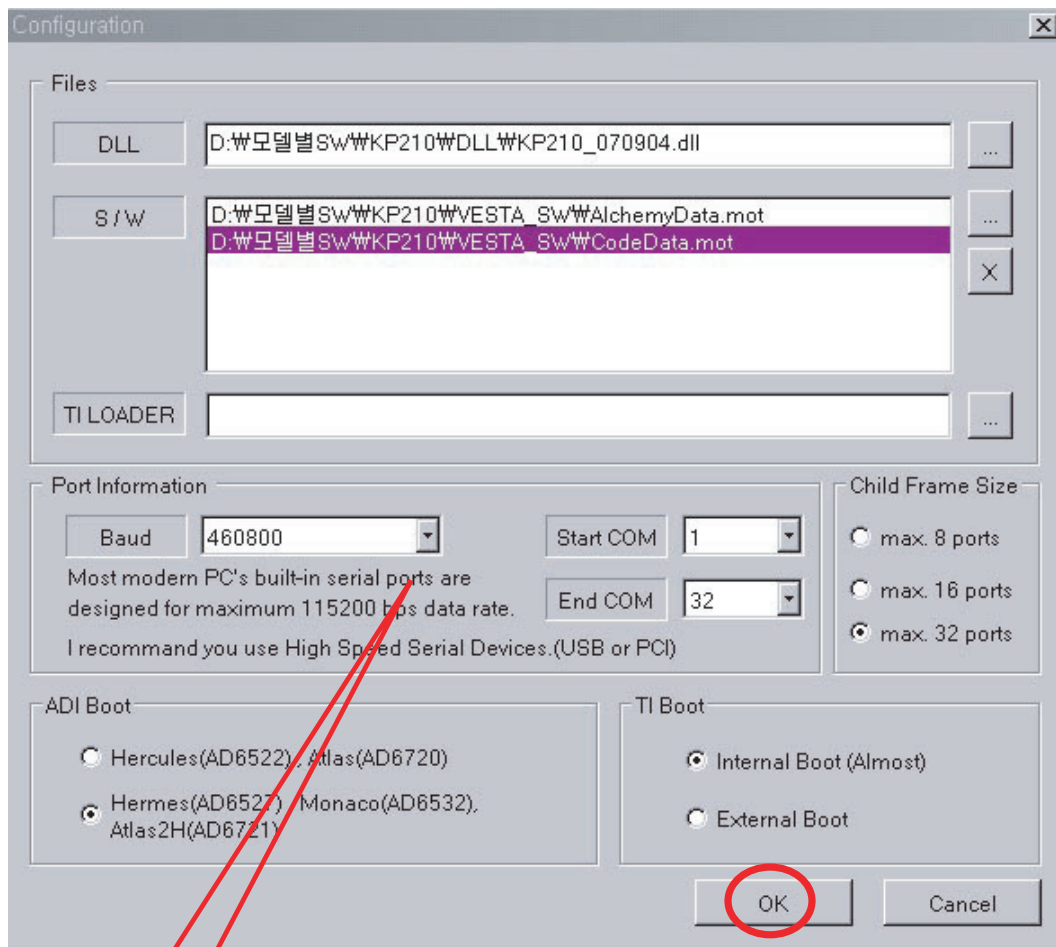
## 5. DOWNLOAD

4. Press  key to select the mot files
5. Select AlchemyData.mot and press open
6. Repeat step 4-5 to select CodeData.mot



## 5. DOWNLOAD

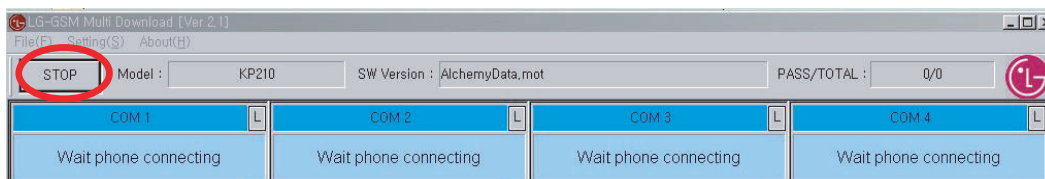
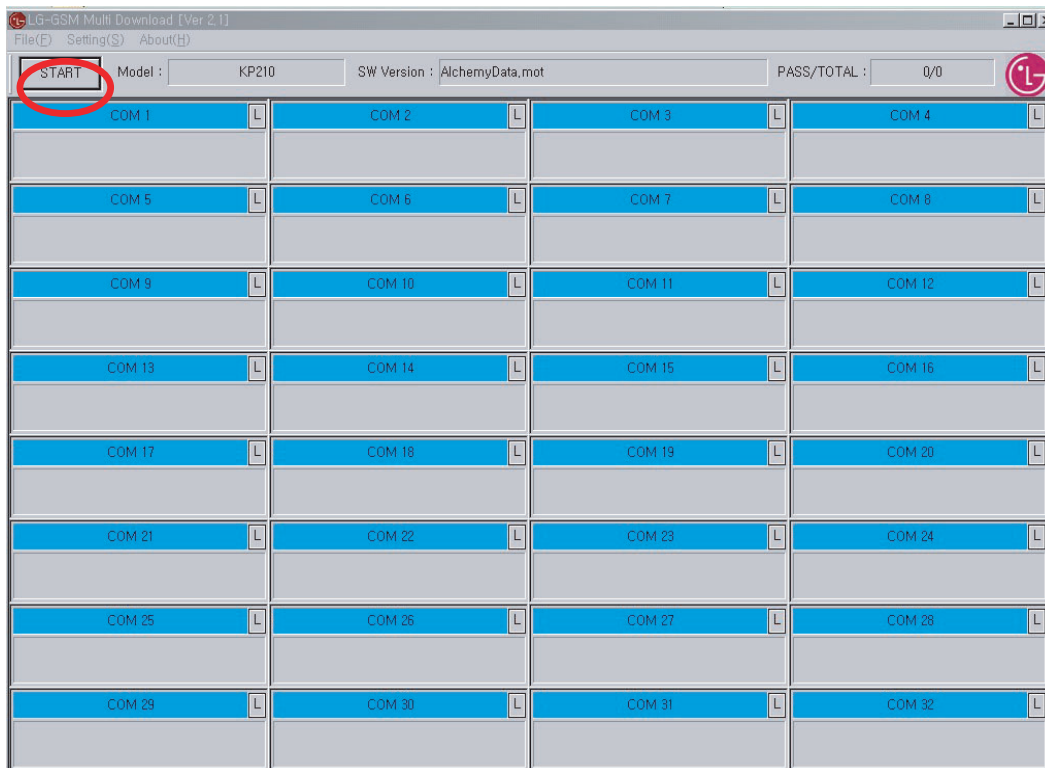
7. Check if the ADI option is set to Hermes
8. Press OK to end Configuration





## 5. DOWNLOAD

9. Press START to execute download
10. Once downloading is started,  
press STOP button to keep from re-downloading after downloading is completed.



## 6. BLOCK DIAGRAM

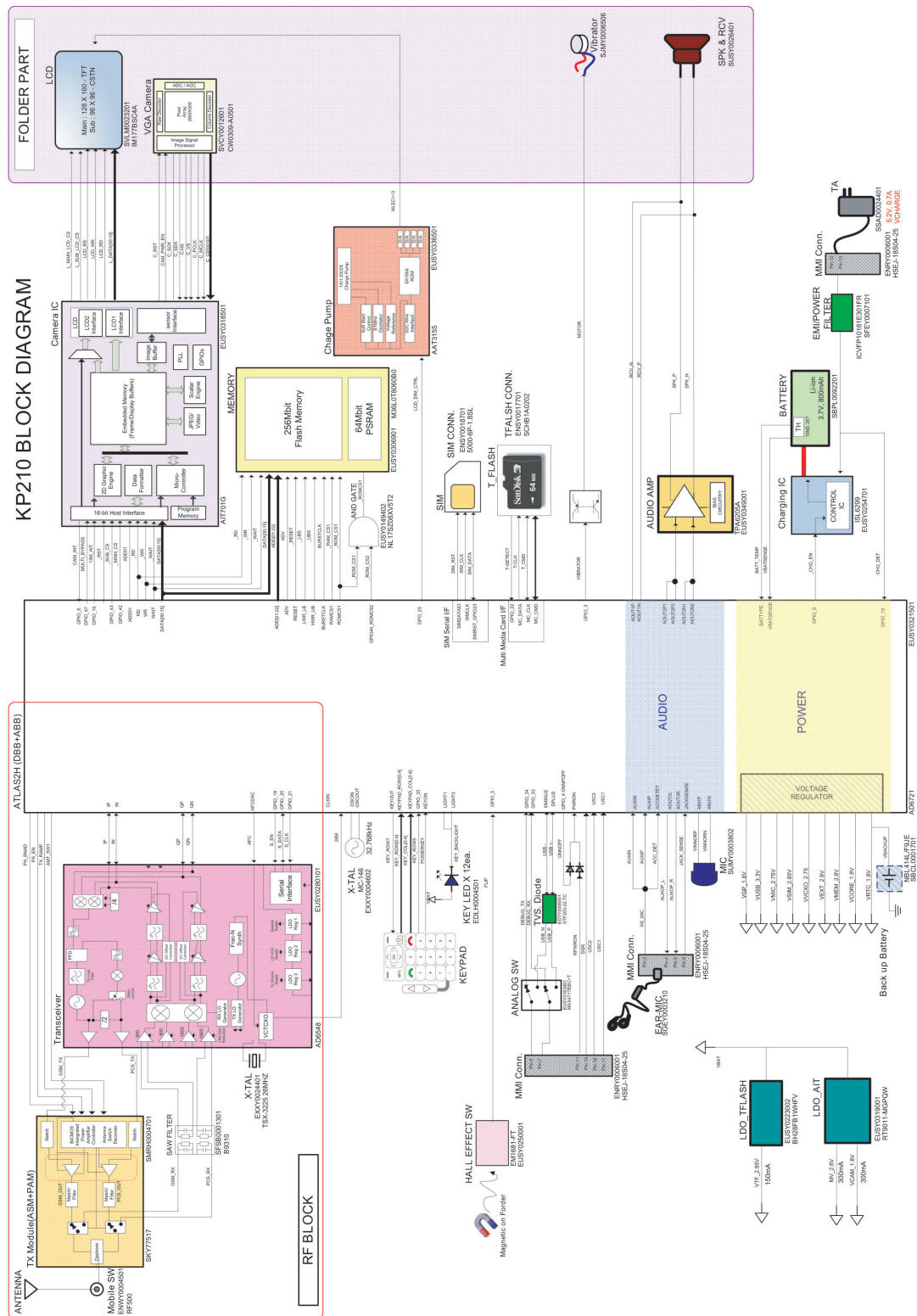
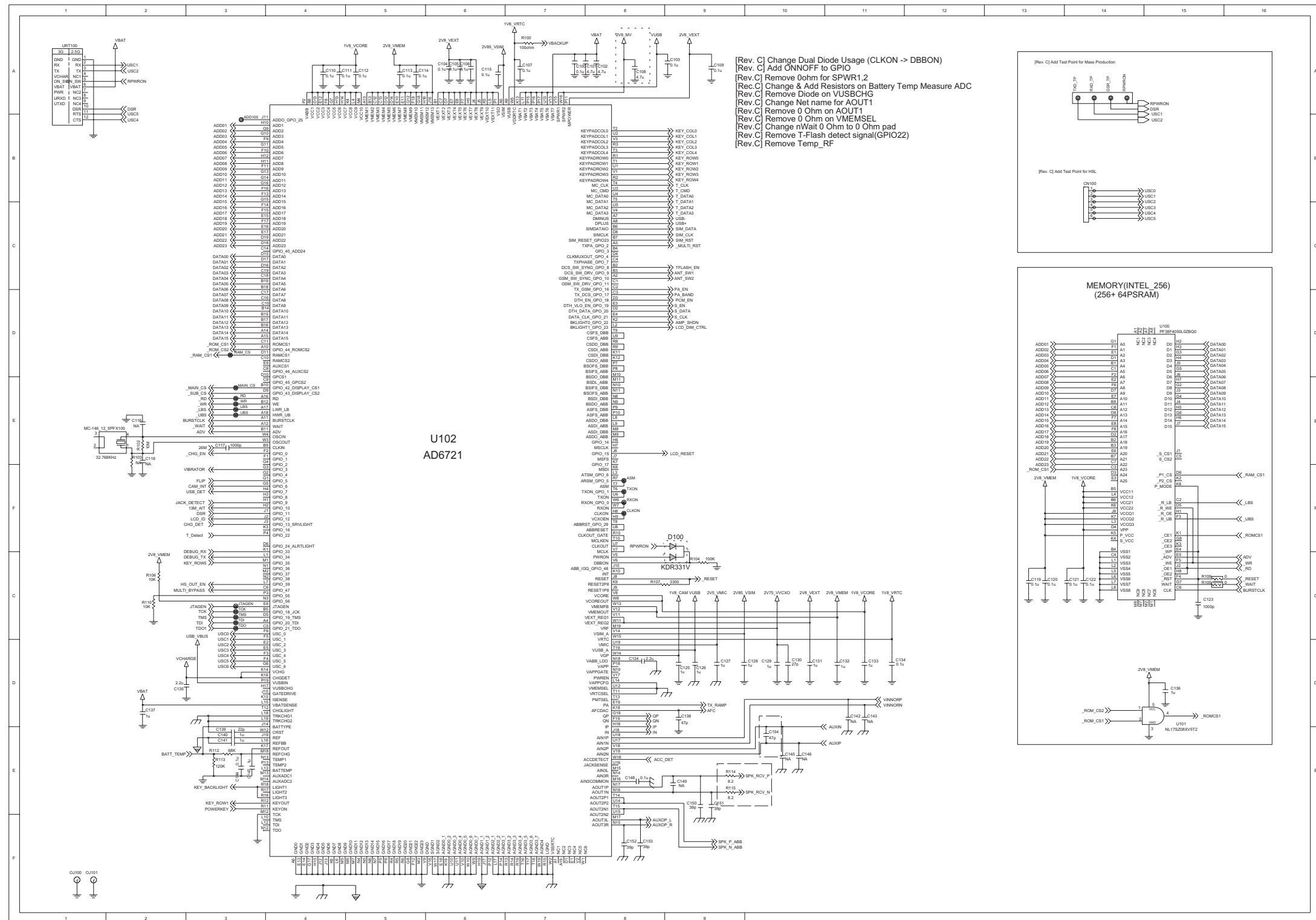


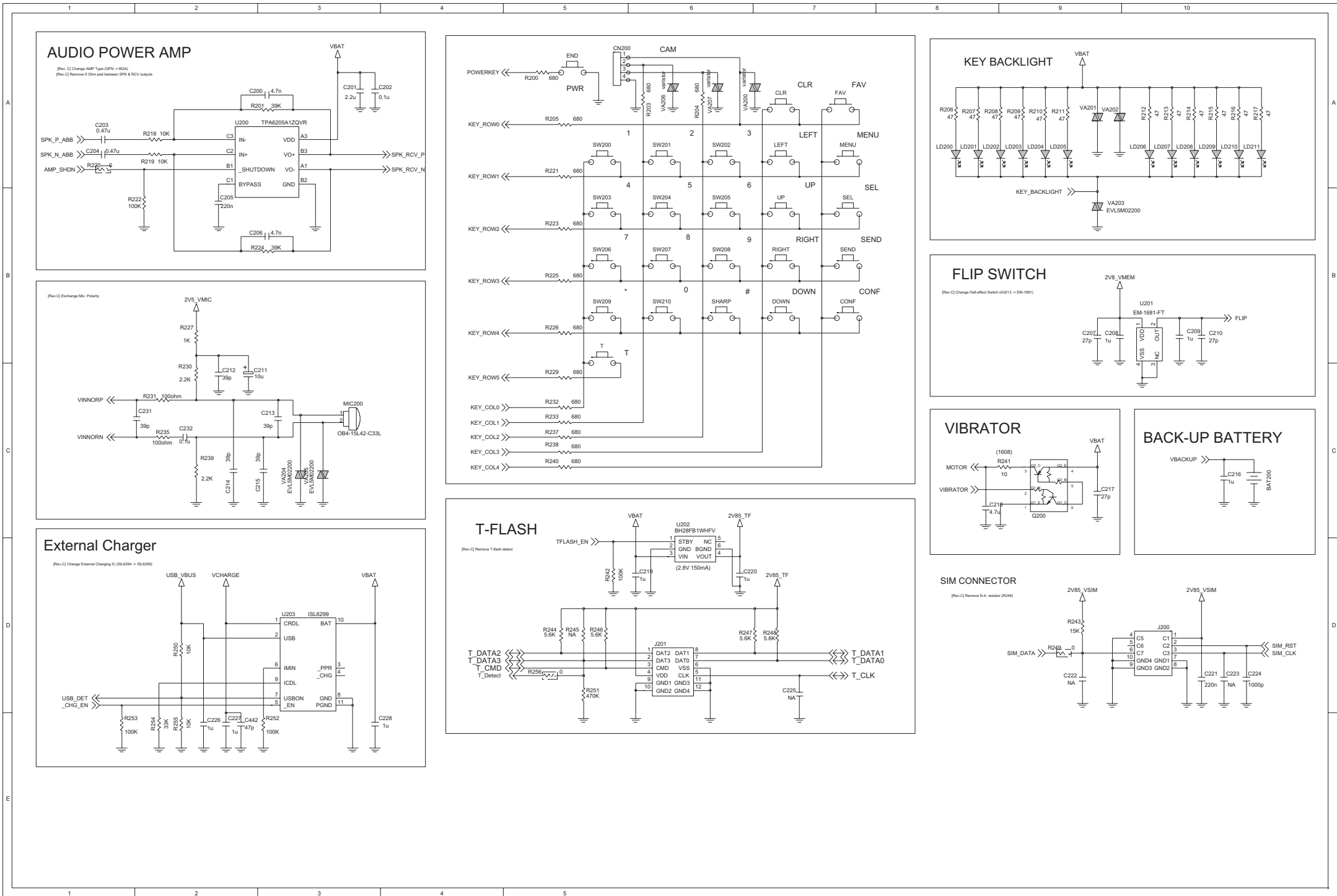
Figure 6.1 LG-KP210a Block Diagram



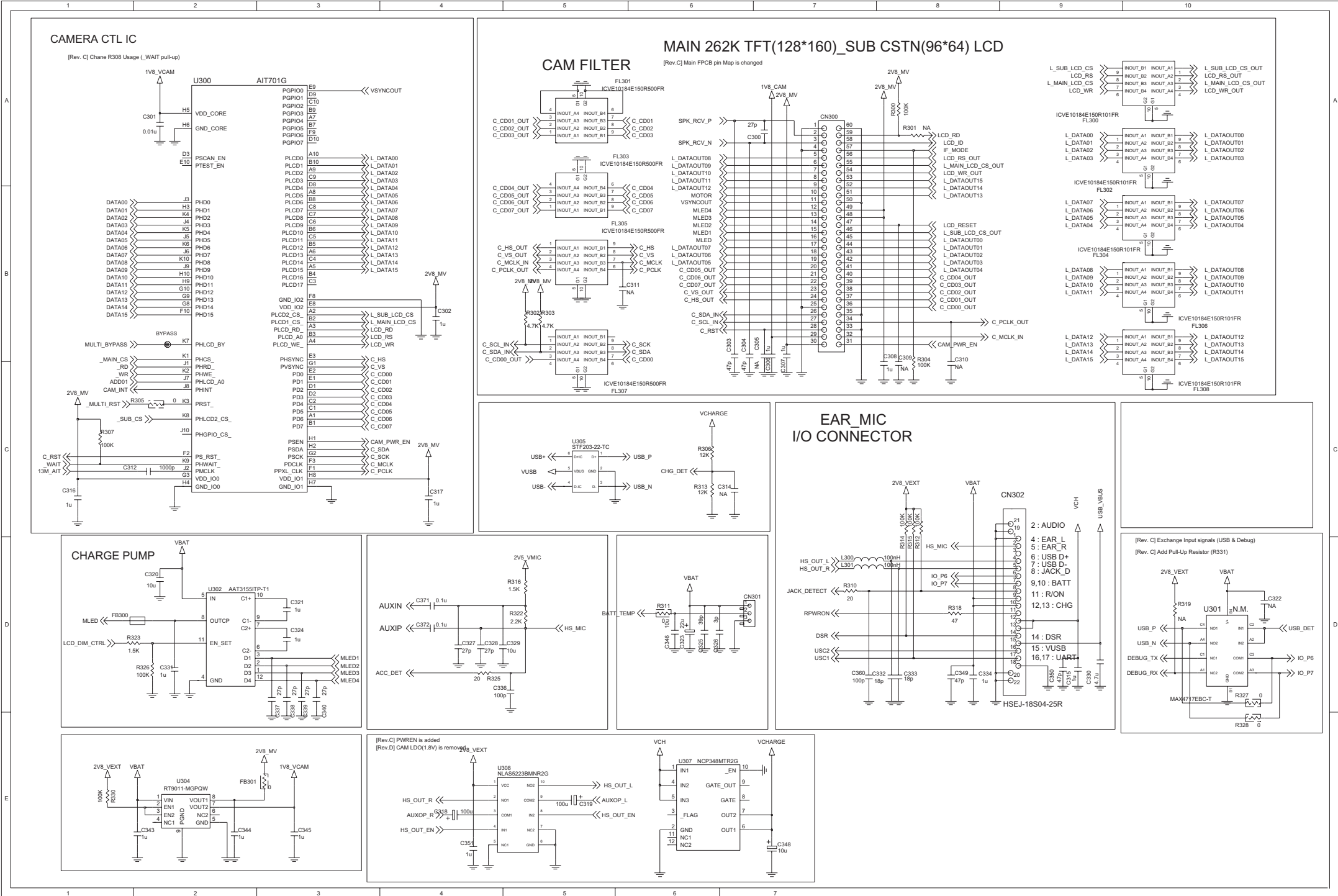
## 7. CIRCUIT DIAGRAM



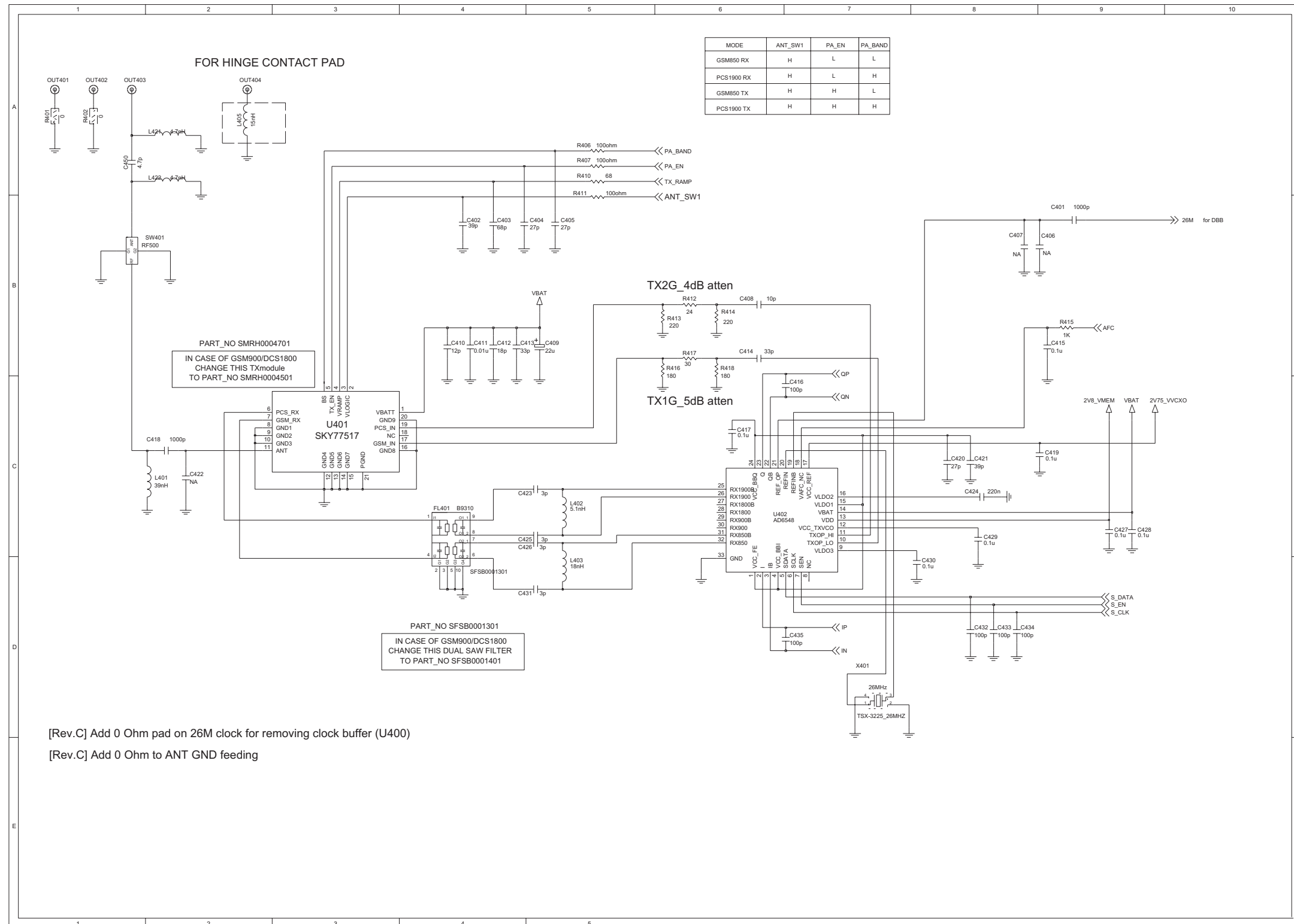
# 7. CIRCUIT DIAGRAM



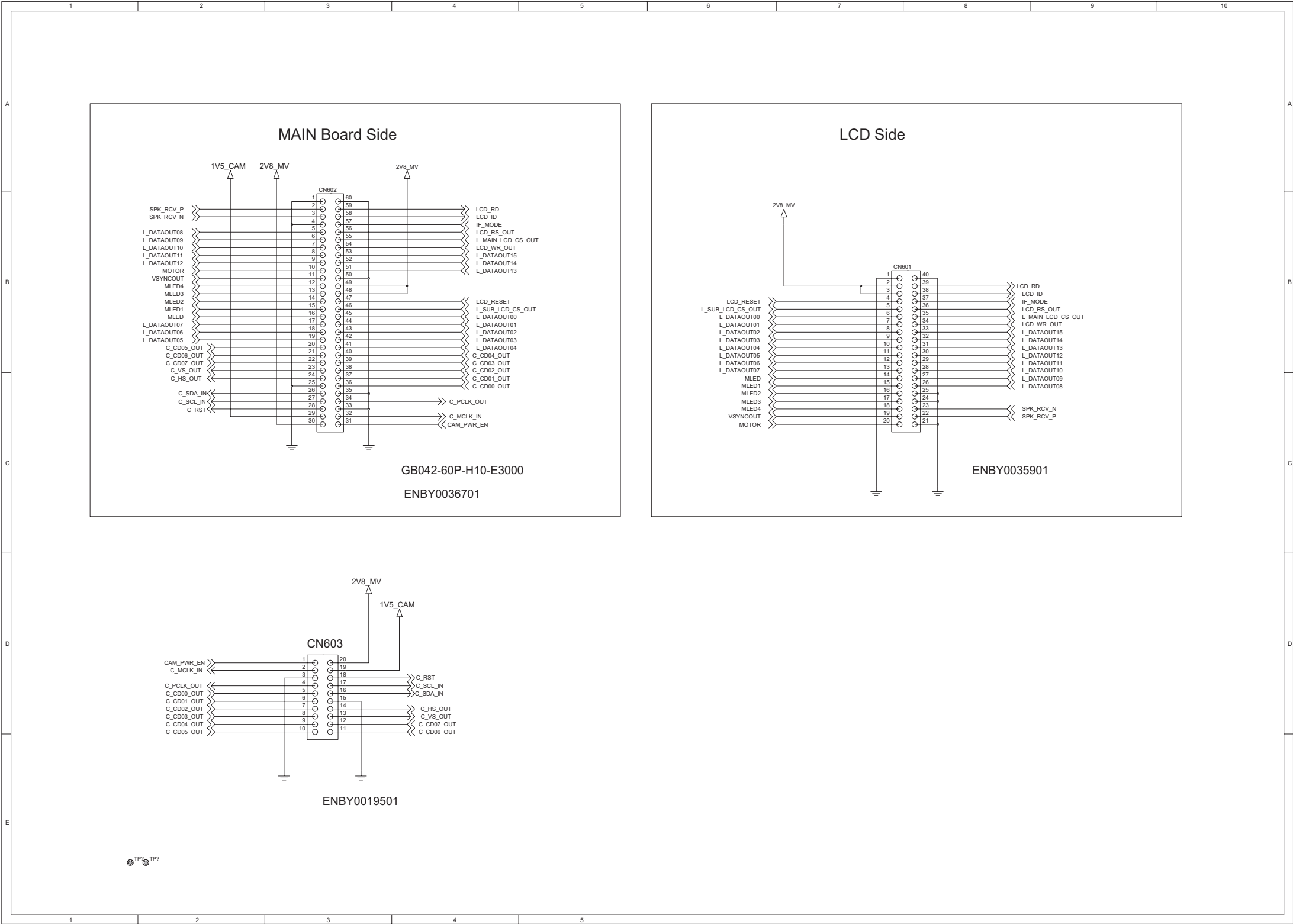
# 7. CIRCUIT DIAGRAM



## 7. CIRCUIT DIAGRAM

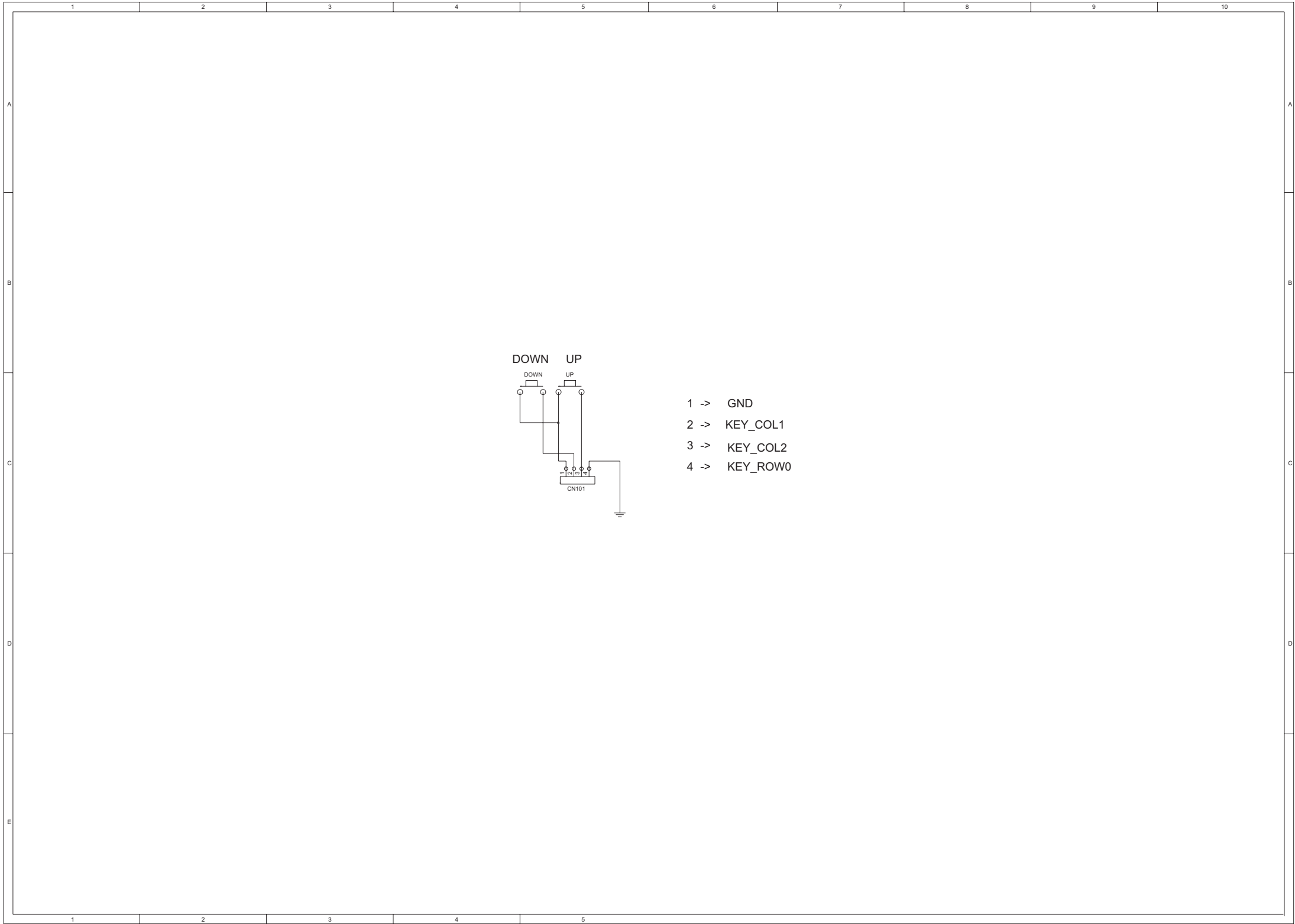


7. CIRCUIT DIAGRAM





7. CIRCUIT DIAGRAM



## 8. BGA IC Pin Check

AD6721: EUSY0321501

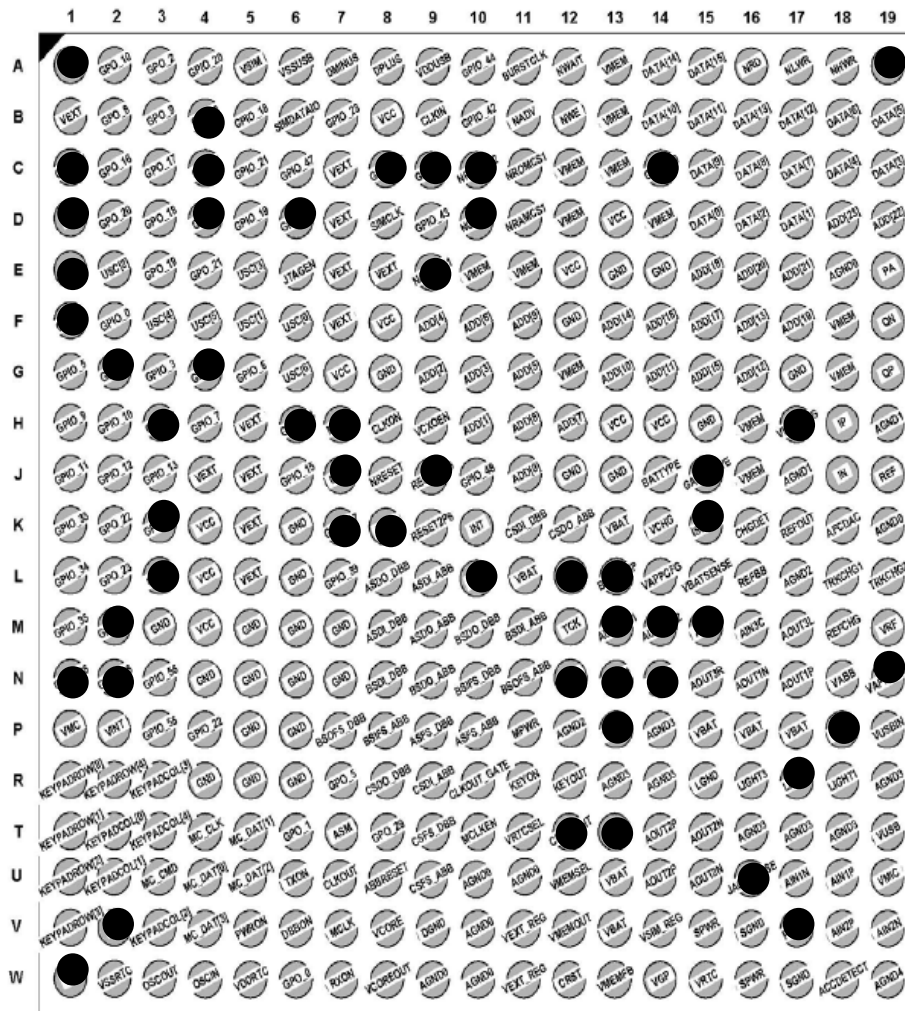


Figure 2 Terminal Locations (Top View)

○ USE  
● NOT IN USE

# 8. BGA IC Pin Check

AIT701G: EUSY0318501

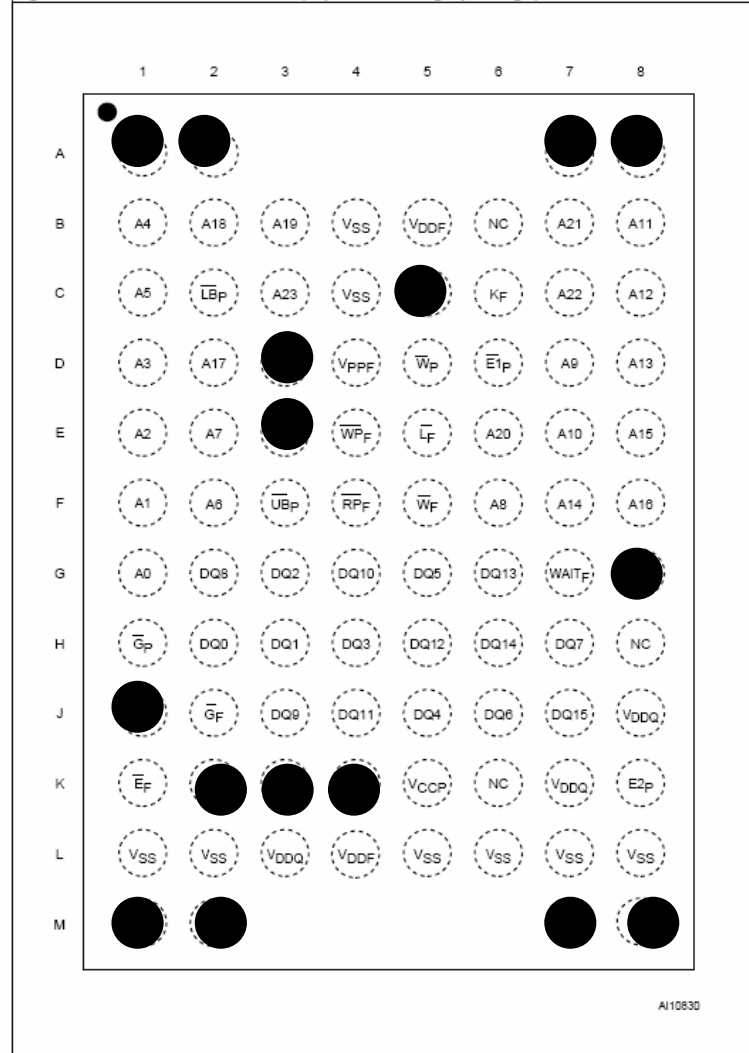
|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|
| A | ○ | ○ | ○ | ○ | ○ | ○ | ● | ○ | ○ | ○  |
| B | ○ | ○ | ○ | ● | ○ | ○ | ● | ○ | ● | ○  |
| C | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ●  |
| D | ○ | ○ | ● |   |   |   |   | ○ | ● | ●  |
| E | ○ | ○ | ○ |   |   |   |   | ○ | ○ | ●  |
| F | ○ | ○ | ○ |   |   |   |   | ○ | ● | ○  |
| G | ○ | ○ | ○ |   |   |   |   | ○ | ○ | ○  |
| H | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○  |
| J | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ●  |
| K | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○  |

AIT701G : EUSY0318501(TOP VIEW)

- USE
- NOT IN USE

### EUSY0306901

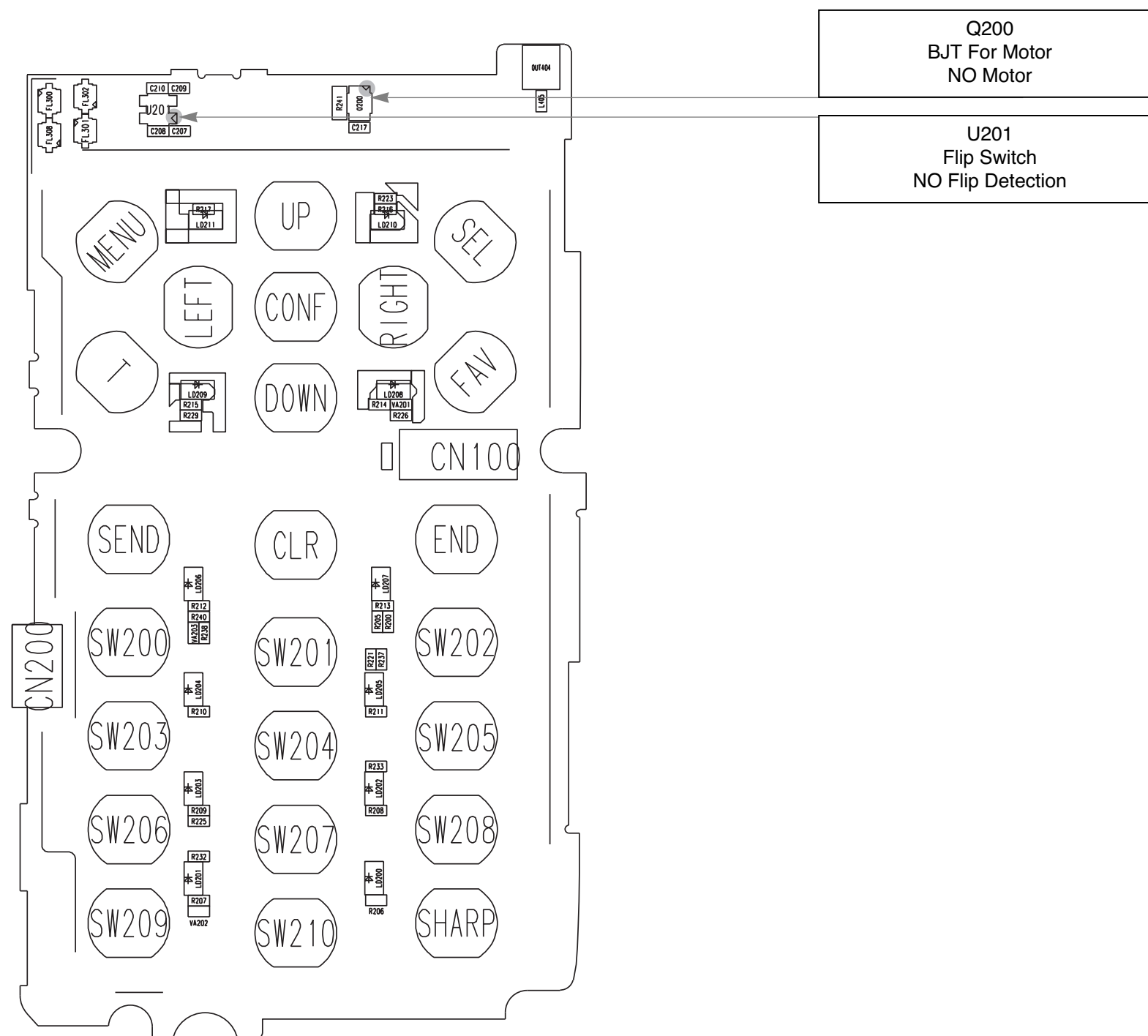
Figure 2. TFBGA connections (top view through package)



○ USE  
● NOT IN USE

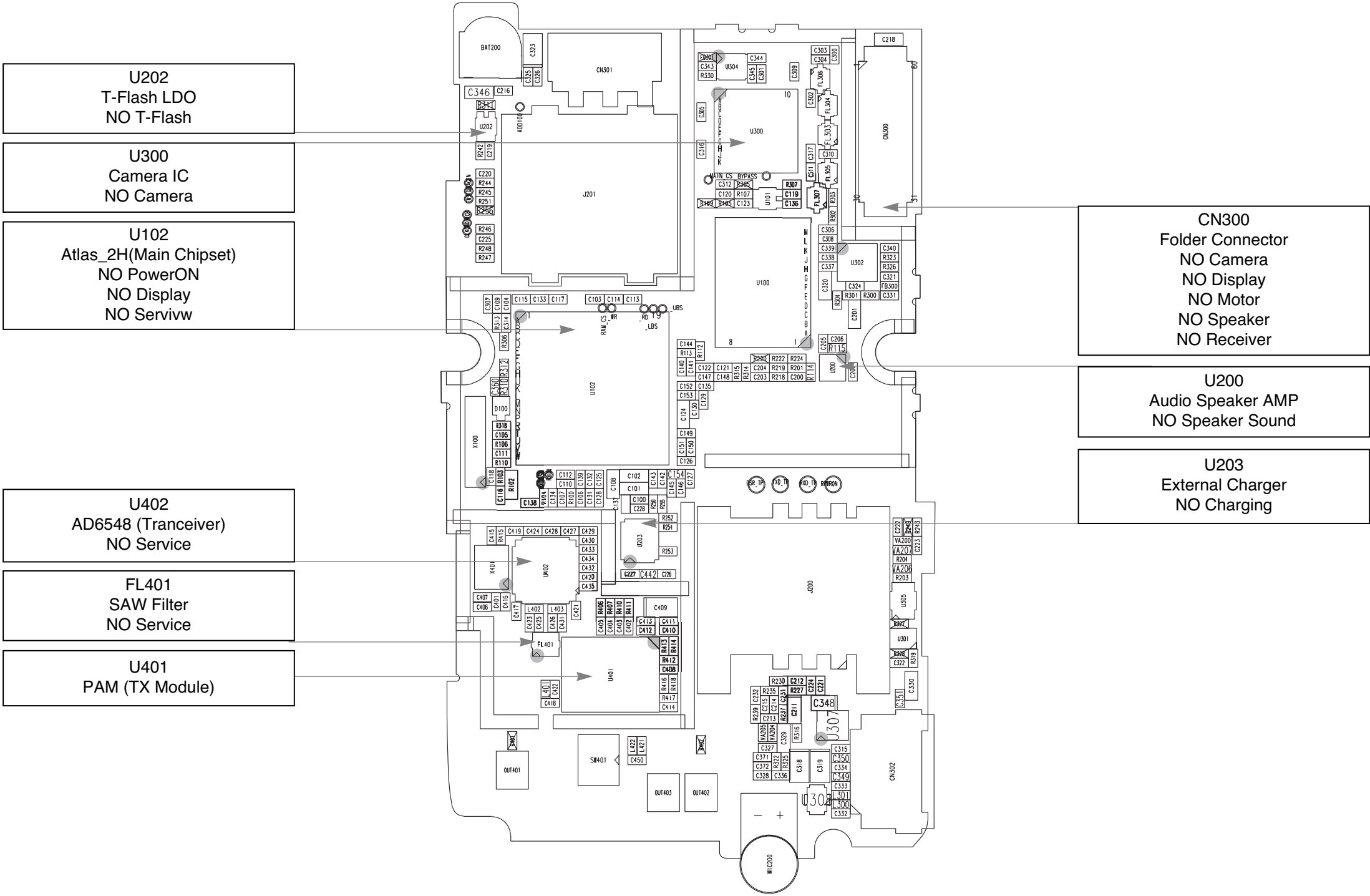


## 9. PCB LAYOUT



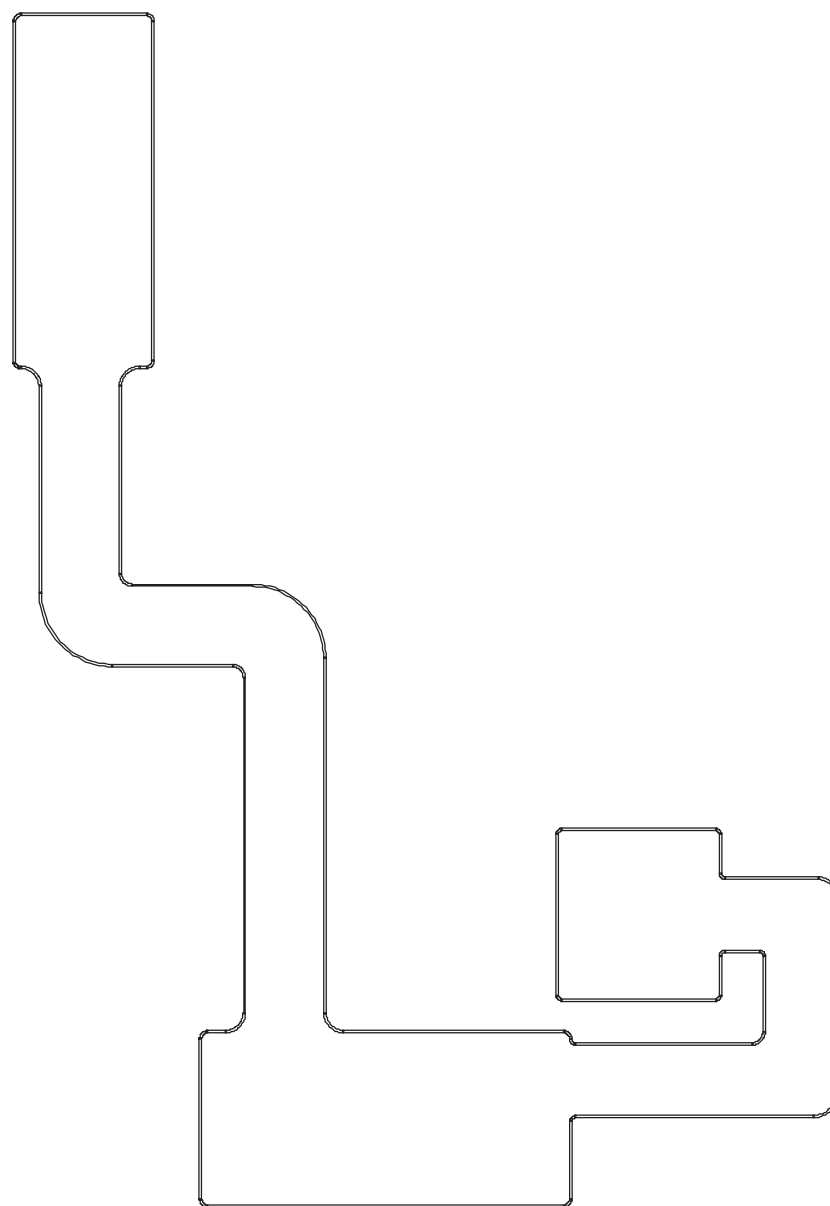
KP210a-MAIN-SPFY0154801-1.0

9. PCB LAYOUT



KP210a-MAIN-SPFY0154801-1.0

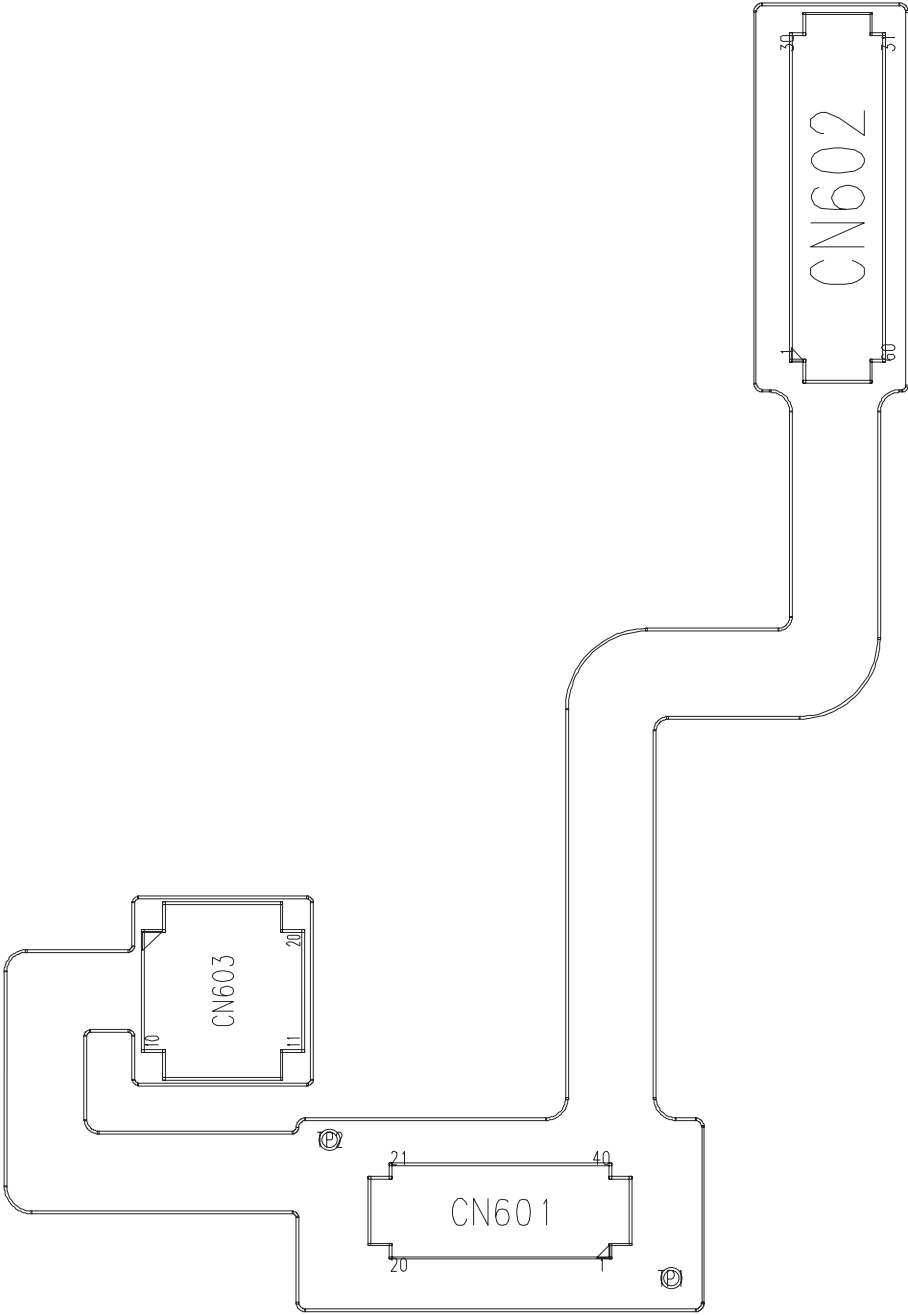
## 9. PCB LAYOUT



KP210a-FPCB-1.0-TOP

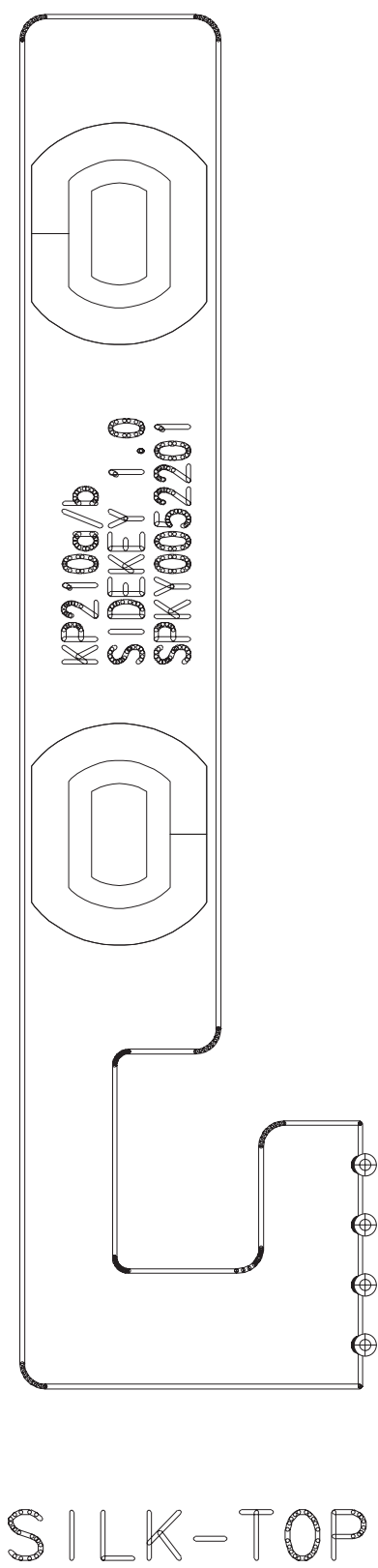


9. PCB LAYOUT



KP210a-FPCB-1.0-BTM

9. PCB LAYOUT





## 10. ENGINEERING MODE

### A. About Engineering Mode

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset.

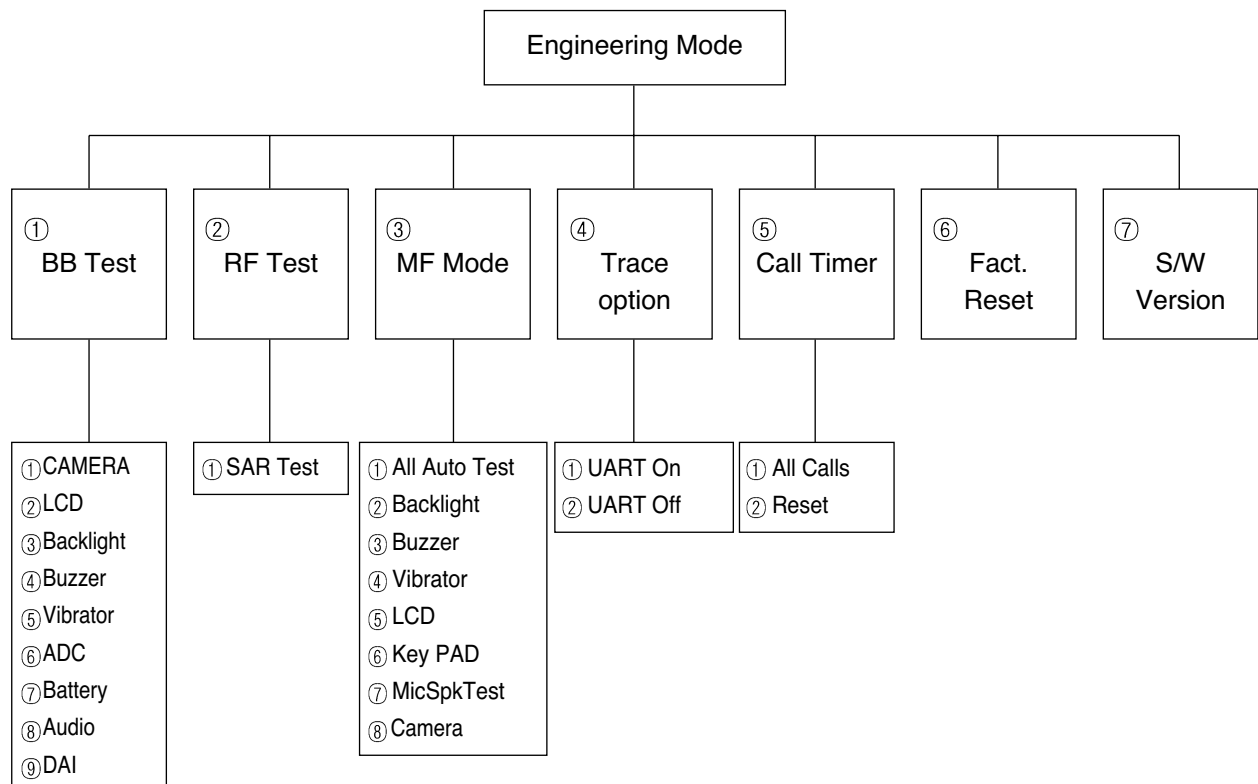
### B. Access Codes

The key sequence for switching the engineering mode on is 2945##. Pressing END will switch back to non-engineering mode operation.

### C. Key Operation

Use Up and Down key to select a menu and press 'select' key to progress the test. Pressing 'back' key will switch back to the original test menu.

### D. Engineering Mode Menu Tree



## 10. ENGINEERING MODE

---

### 10.1 BB Test [MENU 1]

#### 10.1.1 CAMERA

This menu is to test the Camera.

- 1) Main LCD preview: It shows the picture on Main LCD.

#### 10.1.2 LCD

- 1) Brightness
- 2) COLOUR: WHITE, RED, GREEN, BLUE, BLACK

#### 10.1.3 Backlight

This menu is to test the LCD Backlight.

- 1) Backlight on: LCD Backlight on.
- 2) Backlight off: LCD Backlight off.
- 3) Backlight value: This controls brightness of Backlight. When entering into the menu, the present backlight-value in the phone is displayed. Use Left/Right key to adjust the level of brightness. The value of the brightness set at last will be saved in the NVRAM.

#### 10.1.4 Buzzer

This menu is to test the melody sound.

- 1) Melody on: Melody sound is played through the speaker.
- 2) Melody off: Melody sound is off.

#### 10.1.5 Vibrator

This menu is to test the vibration mode.

- 1) Vibrator on: Vibration mode is on.
- 2) Vibrator off: Vibration mode is off.

### 10.1.6 ADC (Analog to Digital Converter)

This displays the value of each ADC.

- 1) MVBAT ADC: Main Voltage Battery ADC
- 2) AUX ADC: Auxiliary ADC
- 3) TEMPER ADC: Temperature ADC

### 10.1.7 BATTERY

- 1) Bat Cal: This displays the value of Battery Calibration. The following menus are displayed in order : BAT\_LEV\_4V, BAT\_LEV\_3\_LIMIT, BAT\_LEV\_2\_LIMIT, BAT\_LEV\_1\_LIMIT, BAT\_IDLE\_LIMIT, BAT\_INCALL\_LIMIT, SHUT\_DOWN\_VOLTAGE, BAT\_RECHARGE\_LMT
- 2) TEMP Cal: This displays the value of Temperature Calibration. The following menus are displayed in order : TEMP\_HIGH\_LIMIT, TEMP\_HIGH\_RECHARGE\_LMT, TEMP\_LOW\_RECHARGE\_LMT, TEMP\_LOW\_LIMIT

### 10.1.8 Audio

This is NOT a necessary menu to be used by neither engineers nor users.

### 9.1.9 DAI (Digital Audio Interface)

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) DAI AUDIO: DAI audio mode
- 2) DAI UPLINK: Speech encoder test
- 3) DAI DOWNLINK: Speech decoder test
- 4) DAI OFF: DAI mode off

## 10. ENGINEERING MODE

---

### 10.2 RF Test [MENU 2]

#### 10.2.1 SAR test

This menu is to test the Specific Absorption Rate.

- 1) SAR test on: Phone continuously process TX only. Call-setup equipment is not required.
- 2) SAR test off: TX process off

### 10.3 MF mode [MENU 3]

This manufacturing mode is designed to do the baseband test automatically. Selecting this menu will process the test automatically, and phone displays the previous menu after completing the test.

#### 10.3.1 All auto test

LCD, Backlight, Vibrator, Buzzer, Key Pad, Mic & Speaker,

#### 10.3.2 Backlight

LCD Backlight is on for about 1.5 seconds at the same time, then off.

#### 10.3.3 Buzzer

This menu is to test the volume of Melody. It rings in the following sequence. Volume 1, Volume 2, Volume 3, Volume 0 (mute), Volume 4, Volume 5.

#### 10.3.4 Vibrator

Vibrator is on for about 1.5 seconds.

#### 10.3.5 LCD

- 1) LCD

Main LCD screen resolution tests horizontally and vertically one by one and fills the screen.

#### 10.3.6 Key pad

When a pop-up message shows 'Press Any Key', you may press any keys including side keys, but not [Soft2 Key]. If the key is working properly, name of the key is displayed on the screen. Test will be completed in 15 seconds automatically.

### 10.3.7 MicSpk Test

The sound from MIC is recorded for about 3 seconds, then it is replayed on the speaker automatically.

### 10.3.8 Camera Test

This menu is to test camera (preview and capture automatically.)

## 10.4 Trace option [MENU 4]

This is NOT a necessary menu to be used by neither engineers nor users.

## 10.5 Call timer [MENU 5]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) All calls: This displays total conversation time. User cannot reset this value.
- 2) Reset settings: This resets total conversation time to this, [00:00:00].

## 10.6 Fact. Reset [MENU 6]

This Factory Reset menu is to format data block in the flash memory and this procedure set up the default value in data block.

### Attention

- ① Fact. Reset (i.e. Factory Reset) should be only used during the Manufacturing process.
- ② Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

## 10.7 S/W version

This displays software version stored in the phone.



## 11. STAND ALONE TEST

---

# 11. STAND ALONE TEST

### 11.1 Introduction

This manual explains how to examine the status of RX and TX of the model.

#### A. Tx Test

TX test - this is to see if the transmitter of the phones is activating normally.

#### B. Rx Test

RX test - this is to see if the receiver of the phones is activating normally.

### 11.2 Setting Method

#### A. COM port

- a. Move your mouse on the "Option" button, then click the right button of the mouse and select "Com setting".
- b. In the "Dialog Menu", select the values as explained below.
  - Port: select a correct COM port
  - Baud rate: 115000
  - Leave the rest as default values

#### B. Tx

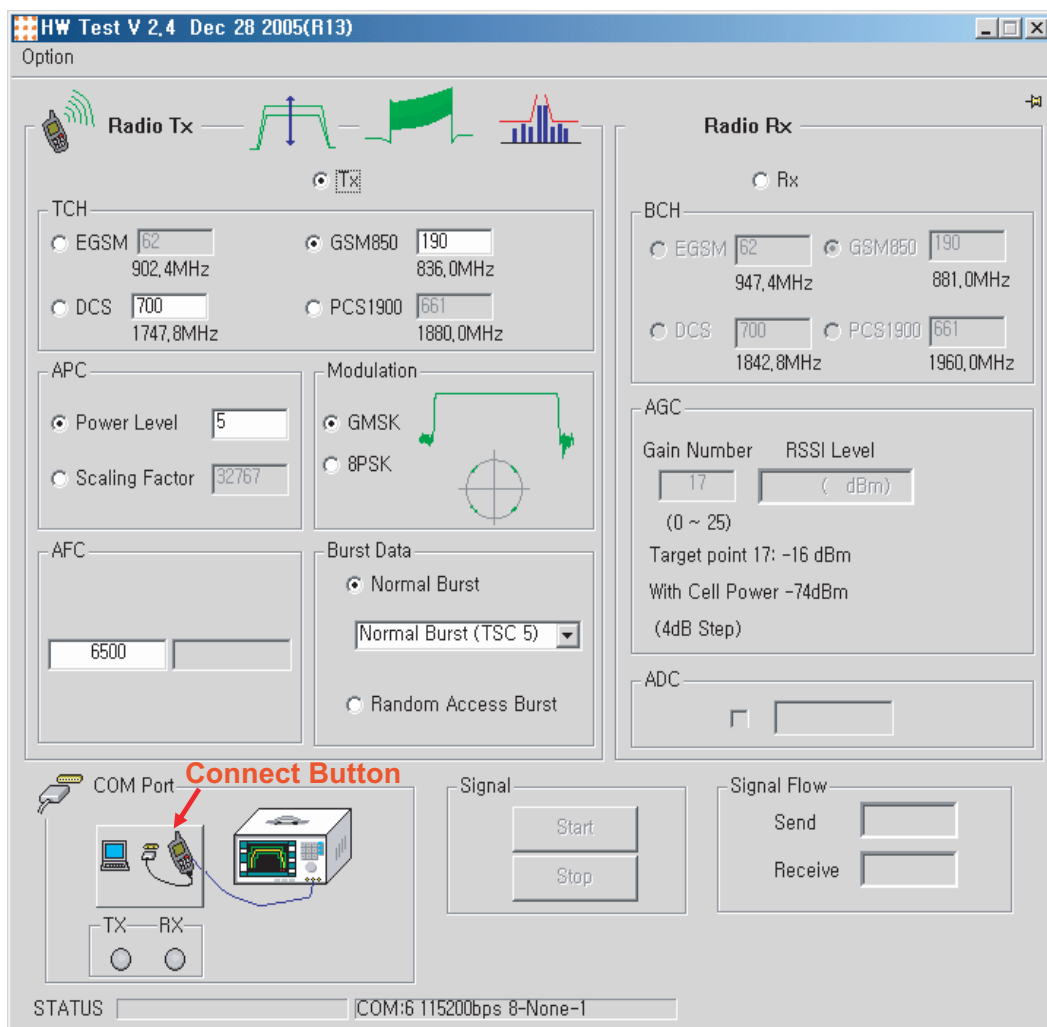
1. Selecting Channel
  - Select one of GSM or DCS/PCS Band and input appropriate channel.
2. Selecting APC
  - a. Select either Power level or Scaling Factor.
  - b. Power level
    - Input appropriate value GSM850 (between 5 ~ 19) or DCS/PCS (between 0 ~ 15)
  - c. Scaling Factor
    - A 'Ramp Factor' appears on the screen.
    - You may adjust the shape of the Ramp or directly input the values.

#### C. Rx

1. Selecting Channel
  - Select one of GSM850 or DCS/PCS Band and input appropriate channel.
2. Gain Control Index (0 ~ 26) and RSSI level
  - See if the value of RSSI is close to -16dBm when setting the value between 0 ~ 26 in Gain Control Index.
  - Normal phone should indicate the value of RSSI close to -16dBm.

### 11.3 Means of Test

- Select a COM port
- Set the values in Tx or Rx
- Select band and channel
- After setting them all above, press connect button.
- Press the start button



**Figure 11.3.1 HW test program**

## 11. STAND ALONE TEST

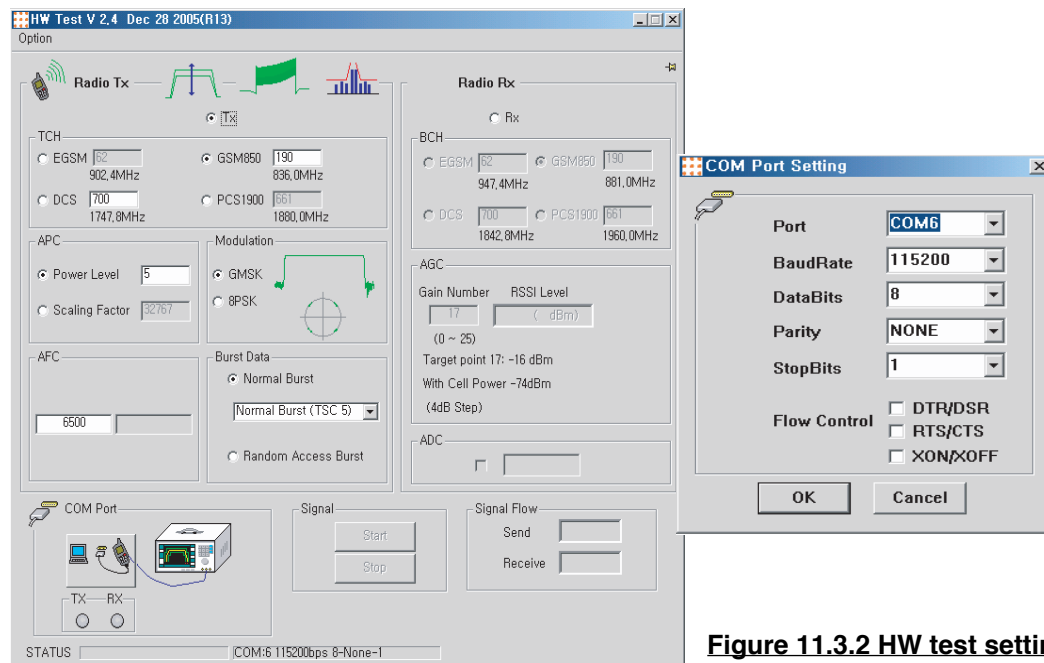


Figure 11.3.2 HW test setting

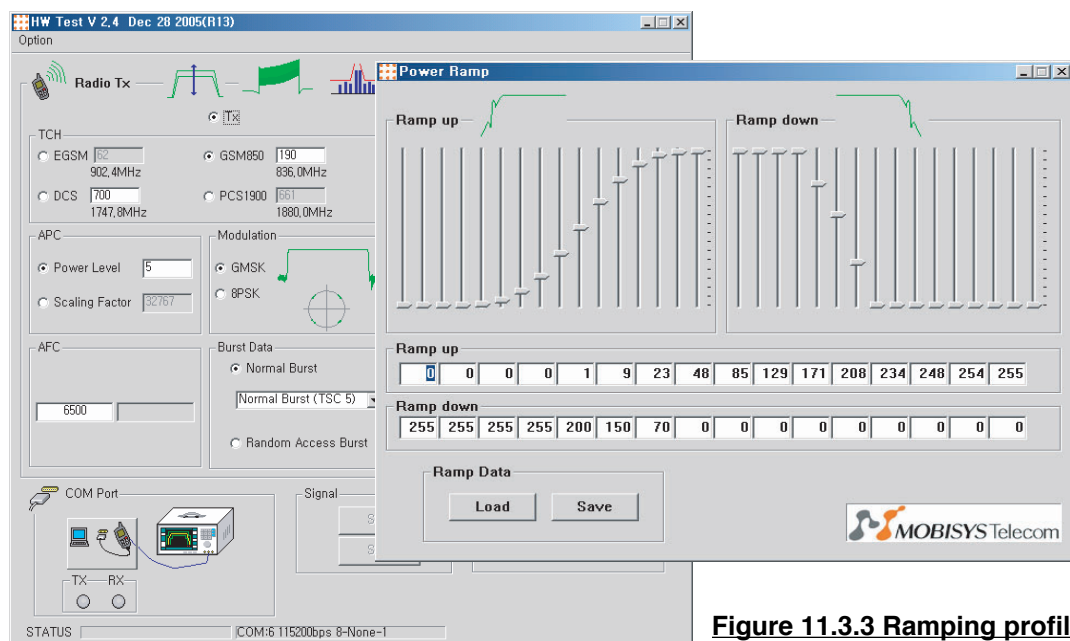


Figure 11.3.3 Ramping profile

## 12. AUTO CALIBRATION

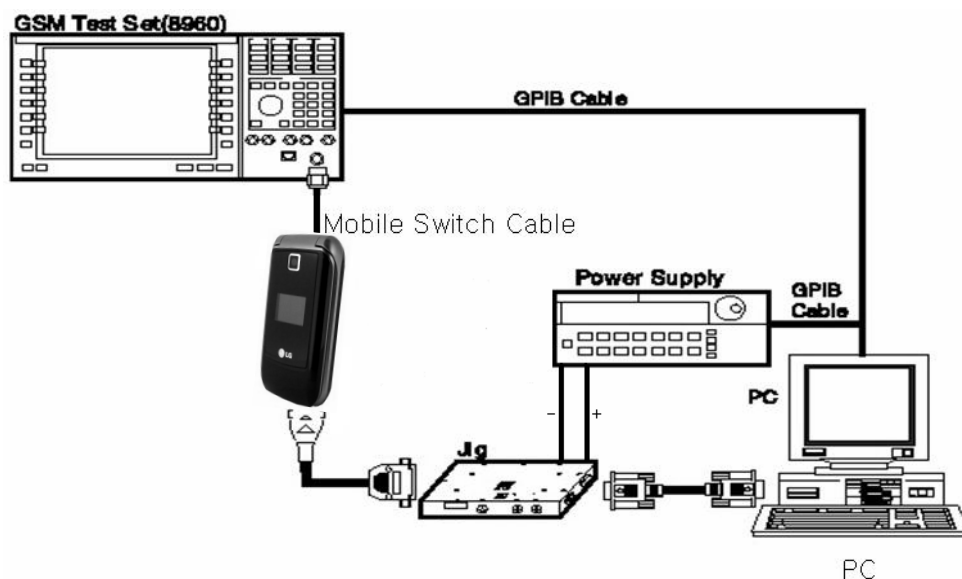
### 12.1 Overview

Auto-cal (Auto Calibration) is the PC side Calibration tool that perform Tx, Rx and Battery Calibration with Agilent 8960(GSM call setting instrument) and Tektronix PS2521G(Programmable Power supply). Auto-cal generates calibration data by communicating with phone and measuring equipment then write it into calibration data block of flash memory in GSM phone.

### 12.2 Equipment List

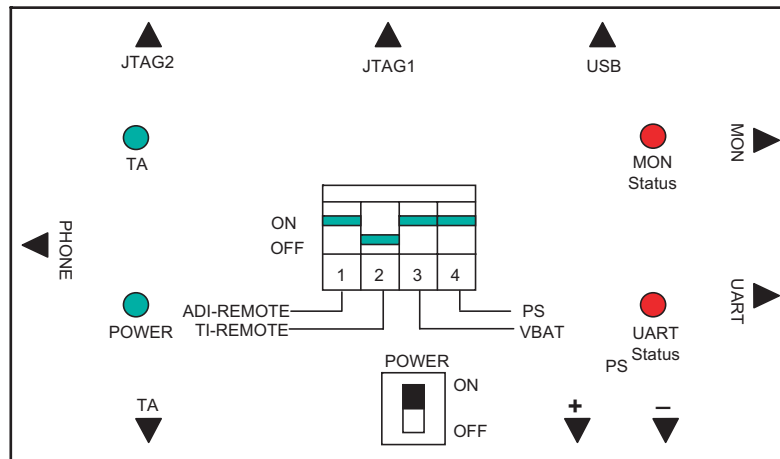
| Equipment for Calibration         | Type / Model                  | Brand   |
|-----------------------------------|-------------------------------|---------|
| Wireless Communication Test Set   | HP-8960                       | Agilent |
| RS-232 Cable and Test JIG         |                               | LG      |
| RF Cable                          |                               | LG      |
| Power Supply                      | HP-66311B                     | Agilent |
| GPIO interface card               | HP-GPIB                       | Agilent |
| Calibration & Final test software |                               | LG      |
| Test SIM Card                     |                               |         |
| PC (for Software Installation)    | Pentium II class above 300MHz |         |

**Table 12.2.1 Calibration Equipment List.**



**Figure 12.2.1 Equipment Setup**

## 12. AUTO CALIBRATION



**Figure 12.2.2 The top view of Test JIG**

### 12.3 Test Jig Operation

| Power Source | Description  |
|--------------|--------------|
| Power Supply | Usually 4.0V |

**Table 12.3.1 Jig Power**

| Switch Number | Name       | Description   |
|---------------|------------|---|
| Switch 1      | ADI-REMOTE | In ON state, phone is awaked. It is used ADI chipset. |
| Switch 2      | TI-REMOTE  | In ON state, phone is awaked. It is used TI chipset.  |
| Switch 3      | VBAT       | Power is provided for phone from battery              |
| Switch 4      | PS         | Power is provided for phone from Power supply         |

**Table 12.3.2 Jig DIP Switch**

| LED Number | Name  | Description  |
|------------|-------|--|
| LED 1      | POWER | Power is provided for Test Jig                     |
| LED 2      | TA    | Indicate charging state of the phone battery       |
| LED 3      | UART  | Indicate data transfer state through the UART port |
| LED 4      | MON   | Indicate data transfer state through the MON port  |

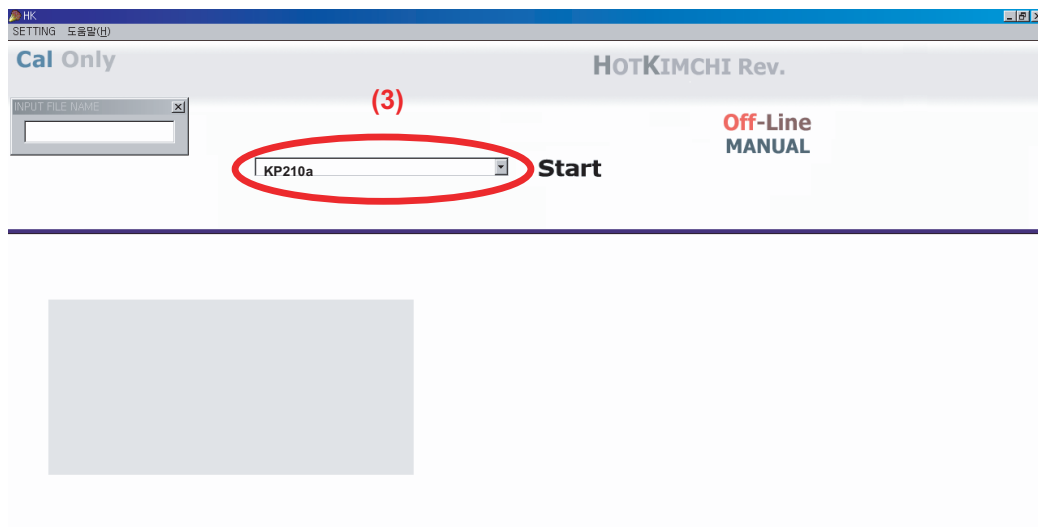
**Table 12.3.3 LED Description**

## 12. AUTO CALIBRATION

1. Connect as Fig 6-2(RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Set the Power Supply 4.0V
3. Set the 3<sup>rd</sup>, 4<sup>th</sup> of DIP SW ON state always
4. Press the Phone power key, if the Remote ON is used, 1st ON state

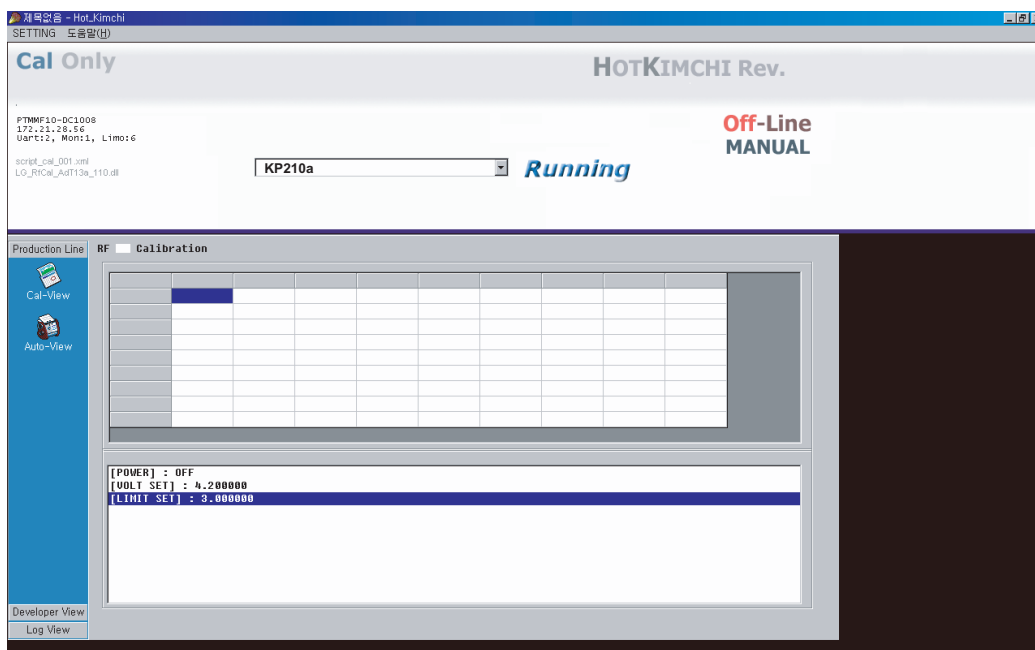
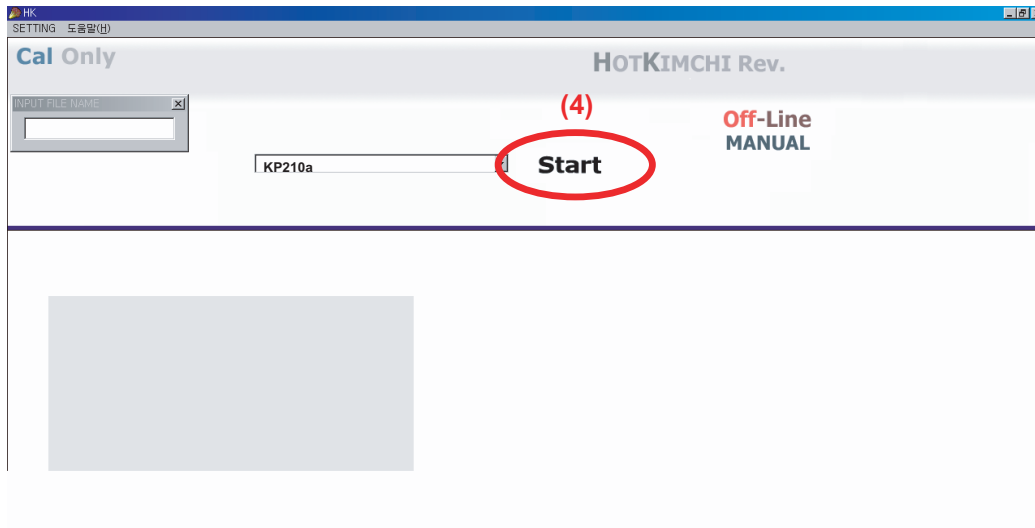
### 12.4 Procedure

1. Connect as Fig 12.2.2 (RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general.)
2. Run Hot\_Kimchi.exe to start calibration.
3. From the Calibration menu, Select KP210!



## 12. AUTO CALIBRATION

### 4. Press Calibration START



### 12.5 AGC

This procedure is for Rx calibration.

In this procedure, We can get RSSI correction value. Set band EGSM and press Start button the result window will show correction values per every power level and gain code and the same measure is performed per every frequency.

### 12.6 APC

This procedure is for Tx calibration.

In this procedure you can get proper scale factor value and measured power level.

### 12.7 ADC

This procedure is for battery calibration.

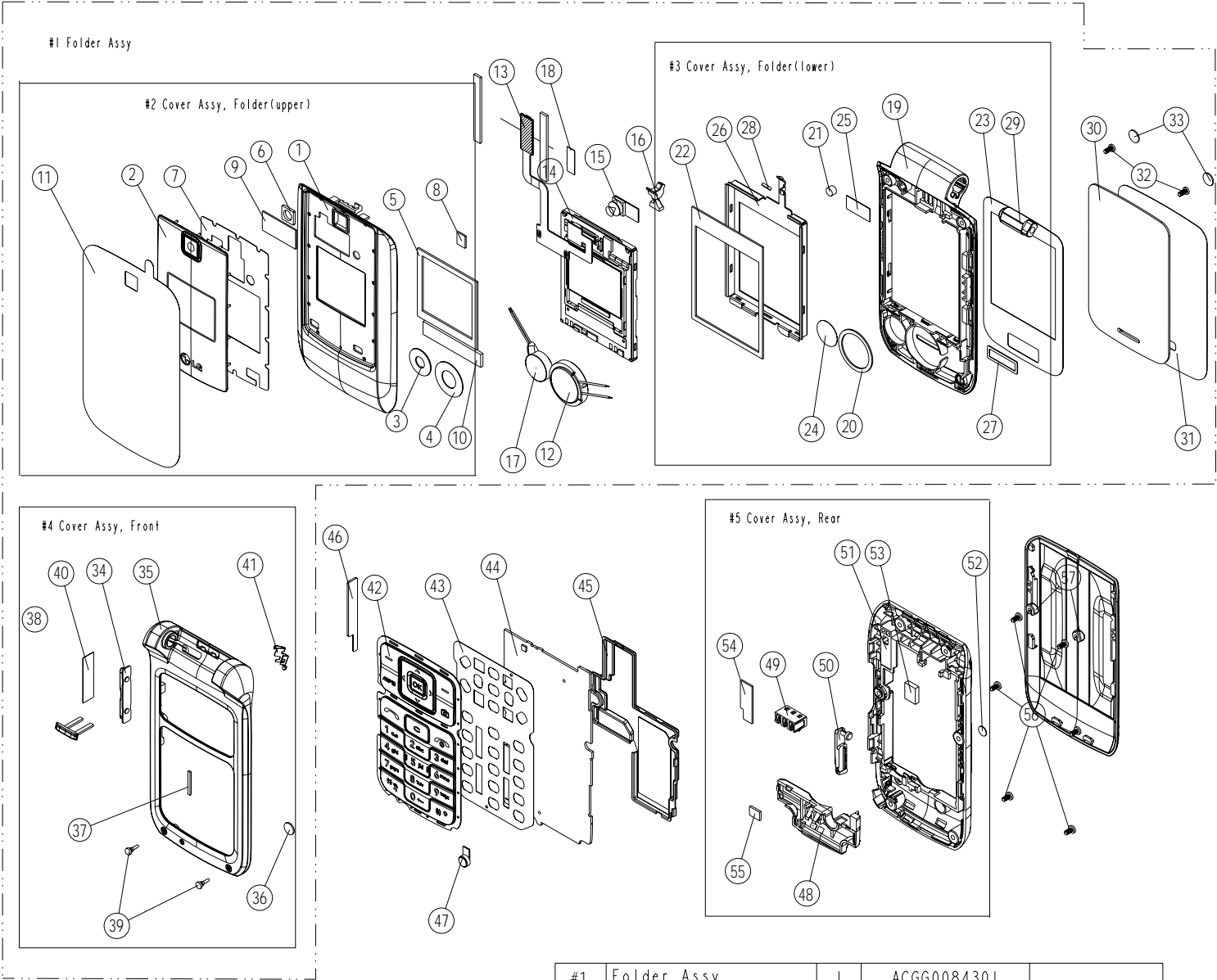
You can get main Battery Config Table and temperature Config Table will be reset.





13. EXPLODED VIEW & REPLACEMENT PART LIST

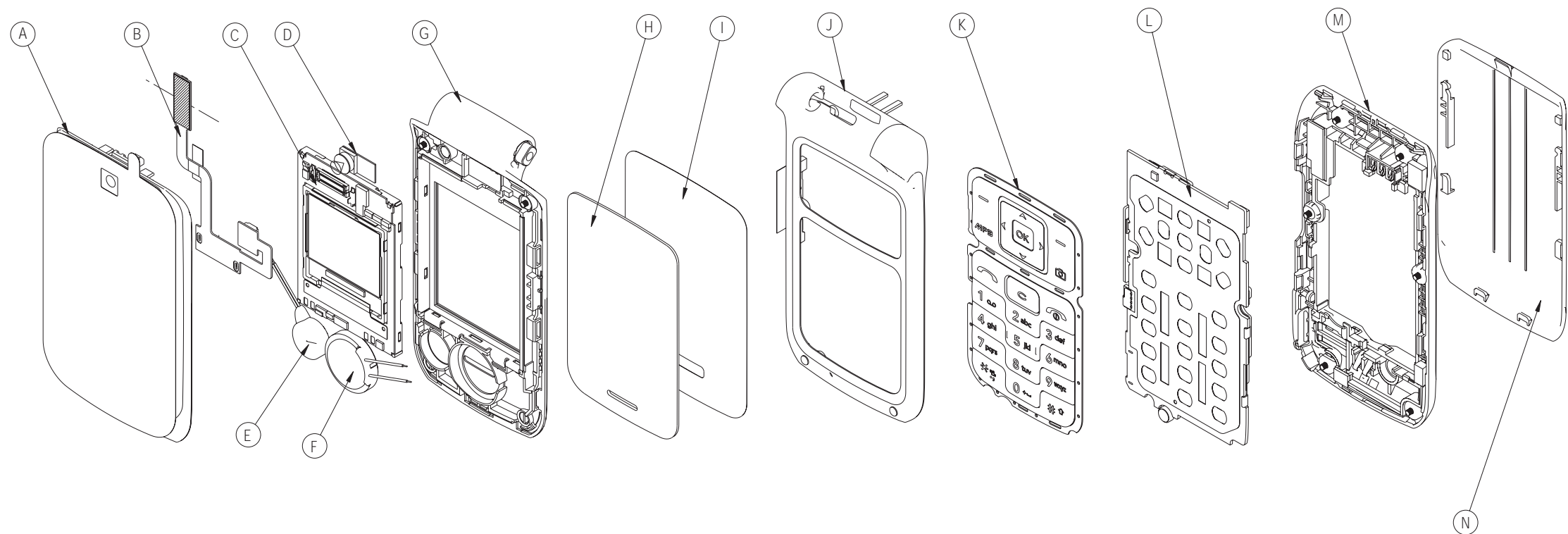
13.1 EXPLODED VIEW



|    |                           |   |             |  |
|----|---------------------------|---|-------------|--|
| #1 | Folder Assy               | I | ACGG008430I |  |
| #2 | Cover Assy, Folder(upper) | I | ACGJ006530I |  |
| #3 | Cover Assy, Folder(lower) | I | ACGH004990I |  |
| #4 | Cover Assy, Front         | I | ACGK009460I |  |
| #5 | Cover Assy, Rear          | I | ACGM009590I |  |

|     |                       |      |              |        |
|-----|-----------------------|------|--------------|--------|
| 57  | CAP, SCREW(MAIN)      | 2    | MCCH011280I  |        |
| 56  | SCREW, MACHINE        | 6    | GMZZ002420I  |        |
| 55  | PAD, MIC              | I    | MPBH003330I  |        |
| 54  | PAD, MAIN CONNECTOR   | I    | MPBU0010503  |        |
| 53  | PAD, BACKUP BATTERY   | I    | MPBZ019350I  |        |
| 52  | LABEL, AS             | I    | MLAB0001102  |        |
| 51  | COVER, REAR           | I    | MCJN007220I  |        |
| 50  | CAP, EARPHONE JACK    | I    | MCCC004790I  |        |
| 49  | BATTERY CONNECTOR     | I    | ENZY001990I  |        |
| 48  | ANTENNA, GSM, FIXED   | I    | SNGF001960I  |        |
| 47  | MICROPHONE            | I    | SUMY0003802  |        |
| 46  | PCB, SIDEKEY          | I    | SPKY005220I  |        |
| 45  | SHIELD CAN            | I    | MCBA002210I  |        |
| 44  | PCB ASSY, MAIN        | I    | SAFY023360I  |        |
| 43  | DOME ASSY, METAL      | I    | ADCA007130I  |        |
| 42  | BUTTON, DIAL          | I    | MBJA002560I  |        |
| 41  | TERMINAL, PIN         | I    | MTCB001150I  |        |
| 40  | TAPE, BUTTON          | I    | MTAG000660I  |        |
| 39  | BUMPER                | 2    | MBHY0003512  |        |
| 38  | STOPPER               | I    | MSGC000130I  |        |
| 37  | PAD, IO CONNECTOR     | I    | MPBZ0193502  |        |
| 36  | FILTER, MIC           | I    | MFBD002630I  |        |
| 35  | COVER, FRONT          | I    | MCJK007610I  |        |
| 34  | BUTTON, SIDE          | I    | MBJL004590I  |        |
| 33  | CAP, SCREW            | 2    | MCCH011290I  |        |
| 32  | SCREW, MACHINE        | 2    | GMEY000200I  |        |
| 31  | TAPE, PROTECTION      | I    | MTAB0188602  |        |
| 30  | WINDOW, LCD           | I    | MWAC008410I  |        |
| 29  | HINGE, FOLDER         | I    | MHFD000590I  |        |
| 28  | PAD, BRACKET          | I    | MPBZ019340I  |        |
| 27  | FILTER, SPEAKER       | I    | MFBC003420I  |        |
| 26  | BRACKET, LCD          | I    | MBFF001520I  |        |
| 25  | TAPE, CAMERA          | I    | MTAK000330I  |        |
| 24  | TAPE, MOTOR           | I    | MTAF001430I  |        |
| 23  | TAPE, WINDOW          | I    | MTAD007430I  |        |
| 22  | PAD, LCD              | I    | MPBG006660I  |        |
| 21  | MAGNET, SWITCH        | I    | MMAA000160I  |        |
| 20  | PAD, RECEIVER         | I    | MPBM001990I  |        |
| 19  | COVER, FOLDER(LOWER)  | I    | MCJH004010I  |        |
| 18  | INSULATOR, FPCB       | I    | MIDZ015160I  |        |
| 17  | VIBRATOR              | I    | SJMY0006508  |        |
| 16  | FOOT, FPCB            | I    | MFDY000800I  |        |
| 15  | CAMERA                | I    | SVCY001260I  |        |
| 14  | LCD                   | I    | SVLM0002320I |        |
| 13  | FPCB, ASSY            | I    | SACY006320I  |        |
| 12  | SPEAKER               | I    | SUSY002640I  |        |
| 11  | TAPE, PROTECTION(SUB) | I    | MTAB018860I  |        |
| 10  | PAD, LDI              | I    | MPBZ019070I  |        |
| 9   | PAD, FPCB CONNECTOR   | I    | MPBU0010502  |        |
| 8   | PAD, CAM CONNECTOR    | I    | MPBU001050I  |        |
| 7   | TAPE, WINDOW(SUB)     | I    | MTAE003210I  |        |
| 6   | PAD, CAMERA           | I    | MPBT004730I  |        |
| 5   | PAD, LCD(SUB)         | I    | MPBQ003310I  |        |
| 4   | PAD, SPEAKER          | I    | MPBN004580I  |        |
| 3   | PAD, MOTOR            | I    | MPBJ004740I  |        |
| 2   | WINDOW ASSY, LCD      | I    | AWAB002920I  |        |
| 1   | COVER, FOLDER(UPPER)  | I    | MCJJ004930I  |        |
| NO. | DESCRIPTION           | Q'TY | DRAWING NO.  | REMARK |

ASS'Y EXPLODED VIEW



|     |                            |      |             |        |
|-----|----------------------------|------|-------------|--------|
| N   | COVER, BATTERY             |      | MCJA0048301 |        |
| M   | COVER ASSY, REAR           |      | ACGM0095901 |        |
| L   | PCB ASSY, MAIN             |      | SAFY0233601 |        |
| K   | BUTTON, DIAL               |      | MBJA0025601 |        |
| J   | COVER ASSY, FRONT          |      | ACGK0094601 |        |
| I   | TAPE, PROTECTION           |      | MTAB0188602 |        |
| H   | WINDOW, LCD                |      | MWAC0084101 |        |
| G   | COVER ASSY, FOLDER (LOWER) |      | ACGH0049901 |        |
| F   | SPEAKER                    |      | MBJA0025601 |        |
| E   | VIBRATOR                   |      | SJMY0006508 |        |
| D   | CAMERA                     |      | SVCY0012601 |        |
| C   | LCD                        |      | SVLM0023201 |        |
| B   | FPCB ASSY                  |      | SACY0063201 |        |
| A   | COVER ASSY, FOLDER (UPPER) |      | ACGJ0065301 |        |
| NO. | DESCRIPTION                | Q'TY | DRAWING NO. | REMARK |

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

### 13.2 Replacement Parts <Mechanic component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

| Level | Location No. | Description               | Part Number | Spec                                    | Color       | Remark |
|-------|--------------|---------------------------|-------------|---|-------------|--------|
| 1     |              | GSM(FOLDER)               | TGFF0099503 |   | Dark Gray   |        |
| 2     | AAAY00       | ADDITION                  | AAAY0285001 |   | Dark Gray   |        |
| 3     | MCJA00       | COVER,BATTERY             | MCJA0055101 | MOLD, PC LUPOY SC-1004A, , , , ,        | Dark Silver |        |
| 2     | APEY00       | PHONE                     | APEY0497411 |   | Dark Gray   |        |
| 3     | ACGG00       | COVER ASSY,FOLDER         | ACGG0084302 |   | Dark Gray   | #1     |
| 4     | ACGH00       | COVER ASSY, FOLDER(LOWER) | ACGH0049902 |   | Dark Gray   | #3, G  |
| 5     | MBFF00       | BRACKET,LCD               | MBFF0015201 | PRESS, STS, , , , ,                     | Silver      | 26     |
| 5     | MCJH00       | COVER,FOLDER(LOWER)       | MCJH0040102 |   | Dark Gray   | 19     |
| 5     | MFBC00       | FILTER,SPEAKER            | MFBC0034201 | COMPLEX, (empty), , , , ,               | Black       | 27     |
| 5     | MHFD00       | HINGE,FOLDER              | MHFD0005901 | Pi5.8 5Kgf, CAN Type, Prexco(Head R1.0) | DEEP SILVER | 29     |
| 5     | MMAA00       | MAGNET,SWITCH             | MMAA0001601 | 7100 magnetic                           | Silver      | 21     |
| 5     | MPBG00       | PAD,LCD                   | MPBG0066601 | COMPLEX, (empty), , , , ,               | Black       | 22     |
| 5     | MPBM00       | PAD,RECEIVER              | MPBM0019901 | COMPLEX, (empty), , , , ,               | Black       |        |
| 5     | MPBZ00       | PAD                       | MPBZ0193401 | COMPLEX, (empty), , , , ,               | Black       | 28     |
| 5     | MTAD00       | TAPE,WINDOW               | MTAD0074301 | COMPLEX, (empty), , , , ,               | Transparent | 23     |
| 5     | MTAF00       | TAPE,MOTOR                | MTAF0014301 | COMPLEX, (empty), , , , ,               | Black       | 24     |
| 5     | MTAK00       | TAPE,CAMERA               | MTAK0003301 | COMPLEX, (empty), , , , ,               | Transparent | 25     |
| 4     | ACGJ00       | COVER ASSY, FOLDER(UPPER) | ACGJ0065302 |   | Dark Gray   | #2, A  |
| 5     | AWAB00       | WINDOW ASSY,LCD           | AWAB0029202 |   | Dark Gray   | 2      |
| 6     | BFAA00       | FILM,INMOLD               | BFAA0085801 | ; ,DARK GRAY , , ,                      | Dark Gray   |        |
| 6     | MWAF00       | WINDOW,LCD(SUB)           | MWAF0038501 | MOLD, PMMA IH830, , , , ,               | Transparent |        |
| 5     | MCJJ00       | COVER,FOLDER(UPPER)       | MCJJ0049302 |   | Dark Gray   | 1      |
| 5     | MPBJ00       | PAD,MOTOR                 | MPBJ0047401 | COMPLEX, (empty), , , , ,               | Black       | 3      |
| 5     | MPBN00       | PAD,SPEAKER               | MPBN0045801 | COMPLEX, (empty), , , , ,               | Black       | 4      |
| 5     | MPBQ00       | PAD,LCD(SUB)              | MPBQ0033101 | COMPLEX, (empty), , , , ,               | Black       | 5      |
| 5     | MPBT00       | PAD,CAMERA                | MPBT0047301 | COMPLEX, (empty), , , , ,               | Black       | 6      |
| 5     | MPBU00       | PAD,CONNECTOR             | MPBU0010501 | COMPLEX, (empty), , , , ,               | Black       | 8      |

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description        | Part Number | Spec   | Color         | Remark |
|-------|--------------|--------------------|-------------|--|---------------|--------|
| 5     | MPBU01       | PAD,CONNECTOR      | MPBU0010502 | COMPLEX, (empty), , , ,  | Black         | 9      |
| 5     | MPBZ00       | PAD                | MPBZ0190701 | COMPLEX, (empty), , , ,  | Black         | 10     |
| 5     | MPBZ01       | PAD                | MPBZ0193504 | COMPLEX, (empty), , , ,  | Black         |        |
| 5     | MTAB00       | TAPE,PROTECTION    | MTAB0188601 | COMPLEX, (empty), , , ,  | Transparent   | 11     |
| 5     | MTAE00       | TAPE,WINDOW(SUB)   | MTAE0032101 | COMPLEX, (empty), , , ,  | Transparent   | 7      |
| 4     | ACGK00       | COVER ASSY,FRONT   | ACGK0094602 |  | Dark Gray     | #4, J  |
| 5     | MBHY00       | BUMPER             | MBHY0003512 | MOLD, Urethane Rubber S190A, , , ,   | Dark Gray     | 39     |
| 5     | MBJL00       | BUTTON,SIDE        | MBJL0050501 | COMPLEX, (empty), , , ,  | Without Color |        |
| 5     | MCJK00       | COVER,FRONT        | MCJK0081301 | MOLD, PC LUPOY SC-1004A, , , ,   | Dark Silver   |        |
| 5     | MFBD00       | FILTER,MIKE        | MFBD0026301 | COMPLEX, (empty), , , ,  | Black         | 36     |
| 5     | MPBZ00       | PAD                | MPBZ0193502 | PAD,IOCONNECTOR  | Black         | 37     |
| 5     | MPBZ01       | PAD                | MPBZ0193503 | PAD,FRONT  | Black         |        |
| 5     | MSGC00       | STOPPER,FOLDER     | MSGC0001304 |  | Dark Silver   | 38     |
| 5     | MTAG00       | TAPE,BUTTON        | MTAG0006601 | COMPLEX, (empty), , , ,  | Green         | 40     |
| 5     | MTCB00       | TERMINAL,PIN       | MTCB0011501 | PRESS, STS, , , ,  | Without Color | 41     |
| 4     | GMEY00       | SCREW MACHINE,BIND | GMEY0002001 | 1.4 mm,3 mm,MSWR3(BK) ,B ,+ ,HEAD t=0.6, HEAD d2.7   |               | 32     |
| 4     | MCCH01       | CAP,SCREW          | MCCH0112904 |  | Dark Silver   | 33     |
| 4     | MFDY00       | FOOT               | MFDY0008001 | MOLD, Urethane Rubber S190A, , , ,   | Silver        | 16     |
| 4     | MIDZ00       | INSULATOR          | MIDZ0151601 | COMPLEX, (empty), , , ,  | Green         | 18     |
| 4     | MLAC00       | LABEL,BARCODE      | MLAC0003401 | EZ LOOKS(user for mechanical)  | Without Color |        |
| 4     | MTAB00       | TAPE,PROTECTION    | MTAB0188602 | KP210 VIVSV, TAPE_PROTECTION(SUB)  | Transparent   | 31, I  |
| 4     | MWAC00       | WINDOW,LCD         | MWAC0084103 | CUTTING, PMMA MR 200, , , ,  | Dark Gray     | 30, H  |
| 3     | ACGM00       | COVER ASSY,REAR    | ACGM0095903 |  | Dark Gray     | #5, M  |
| 4     | MCCC00       | CAP,EARPHONE JACK  | MCCC0047904 |  | Dark Silver   | 50     |
| 4     | MCJN00       | COVER,REAR         | MCJN0077701 | MOLD, PC LUPOY SC-1004A, , , ,   | Dark Silver   |        |
| 4     | MLAB00       | LABEL,A/S          | MLAB0001102 | C2000 USASV DIA 4.0  | White         | 52     |
| 4     | MPBH00       | PAD,MIKE           | MPBH0033301 | COMPLEX, (empty), , , ,  | Black         | 55     |
| 4     | MPBU00       | PAD,CONNECTOR      | MPBU0010503 | COMPLEX, (empty), , , ,  | Black         | 54     |
| 4     | MPBZ00       | PAD                | MPBZ0193501 | COMPLEX, (empty), , , ,  | Black         | 53     |
| 3     | GMEY00       | SCREW MACHINE      | GMZZ0024201 | 1.4 mm,2.7 mm,MSWR3(FN) ,B ,+ , - , , ; ,[empty] ,[empty] , , ,[empty] ,SILVER ,[empty] ,[empty] |               | 56     |

### 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description     | Part Number | Spec                             | Color         | Remark |
|-------|--------------|-----------------|-------------|----------------------------------|---------------|--------|
| 3     | MBJA00       | BUTTON,DIAL     | MBJA0028001 | MOLD, PC LUPOY SC-1004A, , , , , | Without Color |        |
| 3     | MCCH00       | CAP,SCREW       | MCCH0112804 |                                  | Black         | 57     |
| 3     | MLAK00       | LABEL,MODEL     | MLAK0006901 | PRINTING, (empty), , , , ,       | White         |        |
| 5     | ADCA00       | DOME ASSY,METAL | ADCA0071301 | KP210 VIVSV, DOME SHEET          | White         | 43     |
| 5     | MCBA00       | CAN,SHIELD      | MCBA0022101 | PRESS, STS, , , , ,              | Silver        | 45     |
| 5     | MLAZ00       | LABEL           | MLAZ0038301 | PID Label 4 Array                | Without Color |        |

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

LGE Internal Use Only

### 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description      | Part Number | Spec                                | Color | Remark |
|-------|--------------|------------------|-------------|-------------------------------------|-------|--------|
| 6     | C104         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C105         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C106         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C107         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C108         | CAP,CHIP,MAKER   | ECZH0026301 | 4.7 uF,6.3V ,Z ,Y5V ,HD ,1608 ,R/TP |       |        |
| 6     | C109         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C110         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C111         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C112         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C113         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C114         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C115         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C117         | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP         |       |        |
| 6     | C119         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C120         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C121         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C122         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C123         | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP         |       |        |
| 6     | C124         | CAP,CERAMIC,CHIP | ECCH0005603 | 2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP  |       |        |
| 6     | C125         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C126         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C127         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C128         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C129         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C130         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C131         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C132         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C133         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C134         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C135         | CAP,CERAMIC,CHIP | ECCH0000198 | 2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP |       |        |
| 6     | C136         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |



## 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description           | Part Number | Spec                                 | Color | Remark |
|-------|--------------|-----------------------|-------------|--------------------------------------|-------|--------|
| 6     | C137         | CAP,CHIP,MAKER        | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP     |       |        |
| 6     | C138         | CAP,CERAMIC,CHIP      | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C139         | CAP,CERAMIC,CHIP      | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C140         | CAP,CERAMIC,CHIP      | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP    |       |        |
| 6     | C141         | CAP,CERAMIC,CHIP      | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP    |       |        |
| 6     | C144         | CAP,CHIP,MAKER        | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP   |       |        |
| 6     | C145         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C146         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C147         | CAP,CERAMIC,CHIP      | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP    |       |        |
| 6     | C148         | CAP,CHIP,MAKER        | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP   |       |        |
| 6     | C150         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C151         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C152         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C153         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C154         | CAP,CERAMIC,CHIP      | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C200         | CAP,CERAMIC,CHIP      | ECCH0000145 | 1.5 nF,50V,K,X7R,HD,1005,R/TP        |       |        |
| 6     | C201         | CAP,CERAMIC,CHIP      | ECCH0005603 | 2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP   |       |        |
| 6     | C202         | CAP,CHIP,MAKER        | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP   |       |        |
| 6     | C203         | CAP,CHIP,MAKER        | ECZH0001213 | 0.47 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP |       |        |
| 6     | C204         | CAP,CHIP,MAKER        | ECZH0001213 | 0.47 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP |       |        |
| 6     | C205         | CAP,CHIP,MAKER        | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C206         | CAP,CERAMIC,CHIP      | ECCH0000145 | 1.5 nF,50V,K,X7R,HD,1005,R/TP        |       |        |
| 6     | C211         | CAP,TANTAL,CHIP,MAKER | ECTZ0005201 | 10 uF,6.3V ,M ,L _ESR ,1608 ,R/TP    |       |        |
| 6     | C212         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C213         | CAP,CERAMIC,CHIP      | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C214         | CAP,CERAMIC,CHIP      | ECCH0000113 | 18 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C215         | CAP,CERAMIC,CHIP      | ECCH0000113 | 18 pF,50V,J,NP0,TC,1005,R/TP         |       |        |
| 6     | C216         | CAP,CHIP,MAKER        | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP     |       |        |
| 6     | C218         | CAP,CERAMIC,CHIP      | ECCH0007802 | 4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP   |       |        |
| 6     | C219         | CAP,CHIP,MAKER        | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP     |       |        |
| 6     | C220         | CAP,CERAMIC,CHIP      | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP    |       |        |

### 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description      | Part Number | Spec  | Color | Remark |
|-------|--------------|------------------|-------------|---|-------|--------|
| 6     | C221         | CAP,CHIP,MAKER   | ECZH0001211 | 220 nF,10V ,Z ,Y5V ,HD ,1005 ,R/TP  |       |        |
| 6     | C224         | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP   |       |        |
| 6     | C226         | CAP,CHIP,MAKER   | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP  |       |        |
| 6     | C227         | CAP,CHIP,MAKER   | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP  |       |        |
| 6     | C228         | CAP,CHIP,MAKER   | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP  |       |        |
| 6     | C231         | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C232         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C300         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C301         | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP  |       |        |
| 6     | C302         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C303         | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C304         | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C306         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C307         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C308         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C312         | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP   |       |        |
| 6     | C315         | CAP,CHIP,MAKER   | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP  |       |        |
| 6     | C316         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C317         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C318         | CAP,TANTAL,CHIP  | ECTH0005202 | 100 uF,4V ,M ,L _ESR ,2012 ,R/TP ,; , , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] |       |        |
| 6     | C319         | CAP,TANTAL,CHIP  | ECTH0005202 | 100 uF,4V ,M ,L _ESR ,2012 ,R/TP ,; , , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] |       |        |
| 6     | C320         | CAP,CERAMIC,CHIP | ECCH0005604 | 10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP  |       |        |
| 6     | C321         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C323         | CAP,TANTAL,CHIP  | ECTH0005703 | 22 uF,10V ,M ,L _ESR ,2012 ,R/TP ,; , , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] , [empty] |       |        |
| 6     | C324         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C325         | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C326         | CAP,CERAMIC,CHIP | ECCH0000104 | 3 pF,50V,C,NP0,TC,1005,R/TP   |       |        |
| 6     | C327         | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C328         | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C329         | CAP,CERAMIC,CHIP | ECCH0005604 | 10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP  |       |        |

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description      | Part Number | Spec  | Color | Remark |
|-------|--------------|------------------|-------------|---|-------|--------|
| 6     | C330         | CAP,CERAMIC,CHIP | ECCH0007802 | 4.7 uF,10V ,M ,X5R ,TC ,1608 ,R/TP  |       |        |
| 6     | C331         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C332         | CAP,CERAMIC,CHIP | ECCH0000113 | 18 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C333         | CAP,CERAMIC,CHIP | ECCH0000113 | 18 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C334         | CAP,CHIP,MAKER   | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP  |       |        |
| 6     | C337         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C338         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C339         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C340         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C343         | CAP,CHIP,MAKER   | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP  |       |        |
| 6     | C344         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C345         | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C346         | CAP,CERAMIC,CHIP | ECCH0005604 | 10 uF,6.3V ,M ,X5R ,TC ,1608 ,R/TP  |       |        |
| 6     | C348         | CAP,TANTAL,CHIP  | ECTH0001902 | 10 uF,10V ,M ,L_ESR ,1608 ,R/TP   |       |        |
| 6     | C349         | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C350         | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C351         | CAP,CHIP,MAKER   | ECZH0001215 | 1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP  |       |        |
| 6     | C360         | CAP,CHIP,MAKER   | ECZH0002929 | 100 pF,50V ,J ,X7R ,TC ,1005 ,R/TP  |       |        |
| 6     | C371         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C372         | CAP,CHIP,MAKER   | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP  |       |        |
| 6     | C401         | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP   |       |        |
| 6     | C402         | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C403         | CAP,CHIP,MAKER   | ECZH0000844 | 68 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C404         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C405         | CAP,CHIP,MAKER   | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C408         | CAP,CERAMIC,CHIP | ECCH0000110 | 10 pF,50V,D,NP0,TC,1005,R/TP  |       |        |
| 6     | C409         | CAP,TANTAL,CHIP  | ECTH0005703 | 22 uF,10V ,M ,L_ESR ,2012 ,R/TP ; , , [empty] , [empty] , [empty] , , [empty] , [empty] , [empty] , [empty] , [empty] |       |        |
| 6     | C410         | CAP,CHIP,MAKER   | ECZH0000816 | 12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C411         | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP  |       |        |
| 6     | C412         | CAP,CERAMIC,CHIP | ECCH0000113 | 18 pF,50V,J,NP0,TC,1005,R/TP  |       |        |
| 6     | C413         | CAP,CHIP,MAKER   | ECZH0000830 | 33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |

### 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description              | Part Number | Spec  | Color | Remark |
|-------|--------------|--------------------------|-------------|---|-------|--------|
| 6     | C414         | CAP,CHIP,MAKER           | ECZH0000830 | 33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP                         |       |        |
| 6     | C415         | CAP,CHIP,MAKER           | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP                        |       |        |
| 6     | C416         | CAP,CHIP,MAKER           | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP                        |       |        |
| 6     | C417         | CAP,CHIP,MAKER           | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP                        |       |        |
| 6     | C418         | CAP,CERAMIC,CHIP         | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP                               |       |        |
| 6     | C419         | CAP,CHIP,MAKER           | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP                        |       |        |
| 6     | C420         | CAP,CHIP,MAKER           | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP                         |       |        |
| 6     | C421         | CAP,CERAMIC,CHIP         | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP                              |       |        |
| 6     | C423         | CAP,CERAMIC,CHIP         | ECCH0000104 | 3 pF,50V,C,NP0,TC,1005,R/TP                               |       |        |
| 6     | C424         | CAP,CHIP,MAKER           | ECZH0001216 | 220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP                        |       |        |
| 6     | C425         | CAP,CERAMIC,CHIP         | ECCH0000104 | 3 pF,50V,C,NP0,TC,1005,R/TP                               |       |        |
| 6     | C426         | CAP,CERAMIC,CHIP         | ECCH0000104 | 3 pF,50V,C,NP0,TC,1005,R/TP                               |       |        |
| 6     | C427         | CAP,CHIP,MAKER           | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP                        |       |        |
| 6     | C428         | CAP,CHIP,MAKER           | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP                        |       |        |
| 6     | C429         | CAP,CHIP,MAKER           | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP                        |       |        |
| 6     | C430         | CAP,CHIP,MAKER           | ECZH0003103 | 0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP                        |       |        |
| 6     | C431         | CAP,CERAMIC,CHIP         | ECCH0000104 | 3 pF,50V,C,NP0,TC,1005,R/TP                               |       |        |
| 6     | C432         | CAP,CHIP,MAKER           | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP                        |       |        |
| 6     | C433         | CAP,CHIP,MAKER           | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP                        |       |        |
| 6     | C434         | CAP,CHIP,MAKER           | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP                        |       |        |
| 6     | C435         | CAP,CHIP,MAKER           | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP                        |       |        |
| 6     | C442         | CAP,CERAMIC,CHIP         | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP                              |       |        |
| 6     | C450         | CAP,CHIP,MAKER           | ECZH0000839 | 4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP                        |       |        |
| 6     | CN300        | CONNECTOR,BOARD TO BOARD | ENBY0036801 | 60 PIN,0.4 mm,ETC , ,H=1.0, Socket                        |       |        |
| 6     | CN302        | CONNECTOR,I/O            | ENRY0006401 | 18 PIN,0.4 mm,ANGLE , ,H=2.5, Reverse Type                |       |        |
| 6     | D100         | DIODE,SWITCHING          | EDSY0017301 | VSM ,15 V,100 mA,R/TP ,PB-FREE                            |       |        |
| 6     | FB300        | FILTER,BEAD,CHIP         | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead                                 |       |        |
| 6     | FB302        | FILTER,BEAD,CHIP         | SFBH0008105 | 1800 ohm,1005 ,Chip bead , ,1800ohm , ,[empty] ,R/TP      |       |        |
| 6     | FL303        | FILTER,EMI/POWER         | SFEY0011601 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (50 Ohm,15pF)          |       |        |
| 6     | FL304        | FILTER,EMI/POWER         | SFEY0010501 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free |       |        |
| 6     | FL305        | FILTER,EMI/POWER         | SFEY0011601 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (50 Ohm,15pF)          |       |        |

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description      | Part Number | Spec  | Color | Remark |
|-------|--------------|------------------|-------------|---|-------|--------|
| 6     | FL306        | FILTER,EMI/POWER | SFEY0010501 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free   |       |        |
| 6     | FL307        | FILTER,EMI/POWER | SFEY0011601 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (50 Ohm,15pF)  |       |        |
| 6     | FL401        | FILTER,SAW,DUAL  | SFSB0001301 | 881.5 MHz,25 MHz,1.8 dB,30 dB,1960 MHz,60 MHz,2.3 dB,12 dB,2.0*1.6*0.68 ,SMD ,869M~894M,1930M~1990M,10p,B,150_82,150_18,GSM 850+PCS Rx ,; ,881.5, 1960 ,2.0*1.6*0.68 ,SMD ,R/TP |       |        |
| 6     | J200         | CONN,SOCKET      | ENSY0018701 | 6 PIN,ETC , ,2.54 mm,H=1.8  |       |        |
| 6     | J201         | CONN,SOCKET      | ENSY0017701 | 8 PIN,ETC , , mm, Micro-SD, Hinge type  |       |        |
| 6     | L300         | INDUCTOR,CHIP    | ELCH0005009 | 100 nH,J ,1005 ,R/TP ,  |       |        |
| 6     | L301         | INDUCTOR,CHIP    | ELCH0005009 | 100 nH,J ,1005 ,R/TP ,  |       |        |
| 6     | L401         | INDUCTOR,CHIP    | ELCH0005018 | 39 nH,J ,1005 ,R/TP ,   |       |        |
| 6     | L402         | INDUCTOR,CHIP    | ELCH0003814 | 5.1 nH,S ,1005 ,R/TP ,5.1nH,1005  |       |        |
| 6     | L403         | INDUCTOR,CHIP    | ELCH0001032 | 18 nH,J ,1005 ,R/TP ,PBFREE   |       |        |
| 6     | L421         | INDUCTOR,CHIP    | ELCH0001035 | 4.7 nH,S ,1005 ,R/TP ,PBFREE  |       |        |
| 6     | L422         | INDUCTOR,CHIP    | ELCH0001035 | 4.7 nH,S ,1005 ,R/TP ,PBFREE  |       |        |
| 6     | R100         | RES,CHIP         | ERHY0000186 | 2.2 Kohm,1/16W ,F ,1005 ,R/TP   |       |        |
| 6     | R102         | RES,CHIP         | ERHY0000512 | 10M ohm,1/16W,J,1608,R/TP   |       |        |
| 6     | R104         | RES,CHIP,MAKER   | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R106         | RES,CHIP,MAKER   | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R107         | RES,CHIP,MAKER   | ERHZ0000465 | 3300 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R110         | RES,CHIP,MAKER   | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R112         | RES,CHIP,MAKER   | ERHZ0000312 | 68 Kohm,1/16W ,F ,1005 ,R/TP  |       |        |
| 6     | R113         | RES,CHIP,MAKER   | ERHZ0000213 | 120 Kohm,1/16W ,F ,1005 ,R/TP   |       |        |
| 6     | R114         | RES,CHIP,MAKER   | ERHZ0000534 | 8.2 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R115         | RES,CHIP,MAKER   | ERHZ0000534 | 8.2 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R201         | RES,CHIP,MAKER   | ERHZ0000476 | 39 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R203         | RES,CHIP,MAKER   | ERHZ0000326 | 330 ohm,1/16W ,F ,1005 ,R/TP  |       |        |
| 6     | R204         | RES,CHIP,MAKER   | ERHZ0000326 | 330 ohm,1/16W ,F ,1005 ,R/TP  |       |        |
| 6     | R218         | RES,CHIP,MAKER   | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R219         | RES,CHIP,MAKER   | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R222         | RES,CHIP,MAKER   | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R224         | RES,CHIP,MAKER   | ERHZ0000476 | 39 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R227         | RES,CHIP,MAKER   | ERHZ0000404 | 1 Kohm,1/16W ,J ,1005 ,R/TP   |       |        |

### 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description    | Part Number | Spec                          | Color | Remark |
|-------|--------------|----------------|-------------|-------------------------------|-------|--------|
| 6     | R230         | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R231         | RES,CHIP       | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R235         | RES,CHIP       | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R239         | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R242         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R243         | RES,CHIP,MAKER | ERHZ0000422 | 15 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R244         | RES,CHIP,MAKER | ERHZ0000498 | 56 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R246         | RES,CHIP,MAKER | ERHZ0000498 | 56 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R247         | RES,CHIP,MAKER | ERHZ0000498 | 56 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R248         | RES,CHIP,MAKER | ERHZ0000498 | 56 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R250         | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R251         | RES,CHIP,MAKER | ERHZ0000288 | 470 Kohm,1/16W ,F ,1005 ,R/TP |       |        |
| 6     | R252         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R253         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R254         | RES,CHIP,MAKER | ERHZ0000466 | 33 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R255         | RES,CHIP,MAKER | ERHZ0000405 | 10 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R300         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R302         | RES,CHIP,MAKER | ERHZ0000485 | 4700 ohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R303         | RES,CHIP,MAKER | ERHZ0000485 | 4700 ohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R304         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R306         | RES,CHIP,MAKER | ERHZ0002401 | 12 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R307         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R310         | RES,CHIP,MAKER | ERHZ0000435 | 20 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R312         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R313         | RES,CHIP,MAKER | ERHZ0002401 | 12 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R314         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R315         | RES,CHIP,MAKER | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R316         | RES,CHIP,MAKER | ERHZ0000529 | 1.5 Kohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R318         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R322         | RES,CHIP,MAKER | ERHZ0000443 | 2200 ohm,1/16W ,J ,1005 ,R/TP |       |        |
| 6     | R323         | RES,CHIP,MAKER | ERHZ0000529 | 1.5 Kohm,1/16W ,J ,1005 ,R/TP |       |        |

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description       | Part Number | Spec   | Color | Remark |
|-------|--------------|-------------------|-------------|--|-------|--------|
| 6     | R325         | RES,CHIP,MAKER    | ERHZ0000435 | 20 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R326         | RES,CHIP,MAKER    | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R330         | RES,CHIP,MAKER    | ERHZ0000406 | 100 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R406         | RES,CHIP          | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R407         | RES,CHIP          | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R410         | RES,CHIP,MAKER    | ERHZ0000504 | 68 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R411         | RES,CHIP          | ERHY0003301 | 100 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R412         | RES,CHIP,MAKER    | ERHZ0000522 | 24 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R413         | RES,CHIP          | ERHY0003501 | 220 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R414         | RES,CHIP          | ERHY0003501 | 220 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R415         | RES,CHIP,MAKER    | ERHZ0000404 | 1 Kohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R416         | RES,CHIP,MAKER    | ERHZ0000429 | 180 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | R417         | RES,CHIP,MAKER    | ERHZ0000457 | 30 ohm,1/16W ,J ,1005 ,R/TP  |       |        |
| 6     | R418         | RES,CHIP,MAKER    | ERHZ0000429 | 180 ohm,1/16W ,J ,1005 ,R/TP   |       |        |
| 6     | SW401        | CONN,RF SWITCH    | ENWY0004501 | ,SMD , dB,H=3.6, Straight type   |       |        |
| 6     | U100         | IC                | EUSY0306901 | 8*10*1.2 ,88 PIN,R/TP ,Compatible with Intel                             |       |        |
| 6     | U101         | IC                | EUSY0149402 | SOT-553 ,5 PIN,R/TP ,Single 2 Input AND Gate                             |       |        |
| 6     | U102         | IC                | EUSY0321501 | BGA ,361 PIN,R/TP ,13*13   |       |        |
| 6     | U200         | IC                | EUSY0349001 | BGA ,8 PIN,R/TP ,Class AB SPK AMP ,; ,IC,Audio Amplifier                 |       |        |
| 6     | U202         | IC                | EUSY0223002 | HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 2.8V            |       |        |
| 6     | U203         | IC                | EUSY0254701 | DFN 3*3*0.9 ,10 PIN,R/TP ,Charger IC, I Max 1A, Wall Adaptor/USB Charger |       |        |
| 6     | U300         | IC                | EUSY0318501 | BGA ,84 PIN,R/TP ,7x7, VGA Camera Backend IC                             |       |        |
| 6     | U302         | IC                | EUSY0336501 | TSOPJW ,12 PIN,R/TP ,  |       |        |
| 6     | U304         | IC                | EUSY0319001 | WDFN-8L ,8 PIN,R/TP ,300mA/300mA 2.8V/1.8V Dual LDO                      |       |        |
| 6     | U305         | DIODE,TVS         | EDTY0006501 | SC70-6L ,5.25 V,100 W,R/TP ,   |       |        |
| 6     | U307         | IC                | EUSY0319201 | DFN ,10 PIN,R/TP ,OVP  |       |        |
| 6     | U308         | IC                | EUSY0300101 | WQFN ,10 PIN,R/TP ,Small package Dual SPDT analog Switch, PB-Free        |       |        |
| 6     | U401         | RF MODULE,HANDSET | SMRH0004701 | MHz, MHz,Dual band for US ,ASM+TxModule                                  |       |        |
| 6     | U402         | IC                | EUSY0280101 | LFCSP-32 ,32 PIN,R/TP ,GSM QUAD BAND TRANSCEIVER, Othello G.             |       |        |

### 13. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description           | Part Number | Spec  | Color | Remark |
|-------|--------------|-----------------------|-------------|---|-------|--------|
| 6     | VA204        | VARISTOR              | SEVY0003901 | 5.5 V ,SMD ,480pF, 1005   |       |        |
| 6     | VA205        | VARISTOR              | SEVY0003901 | 5.5 V ,SMD ,480pF, 1005   |       |        |
| 6     | X100         | X-TAL                 | EXXY0004602 | .032768 MHz,20 PPM,12.5 pF,65000 ohm,SMD ,6.9*1.4*1.3 ,                       |       |        |
| 6     | X401         | X-TAL                 | EXXY0024401 | 26 MHz,10 PPM,10 pF,.5 ohm,SMD ,32*25*0.6 ,. . . ,10PPM ,10 ,. . . ,SMD ,P/TP |       |        |
| 5     | SAFD00       | PCB ASSY,MAIN,SMT TOP | SAFD0098501 |   | Blue  |        |
| 6     | C207         | CAP,CHIP,MAKER        | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C208         | CAP,CERAMIC,CHIP      | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C209         | CAP,CERAMIC,CHIP      | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP   |       |        |
| 6     | C210         | CAP,CHIP,MAKER        | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | C217         | CAP,CHIP,MAKER        | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP   |       |        |
| 6     | FL300        | FILTER,EMI/POWER      | SFEY0010501 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free                     |       |        |
| 6     | FL301        | FILTER,EMI/POWER      | SFEY0011601 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (50 Ohm,15pF)                              |       |        |
| 6     | FL302        | FILTER,EMI/POWER      | SFEY0010501 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free                     |       |        |
| 6     | FL308        | FILTER,EMI/POWER      | SFEY0010501 | SMD ,SMD ,18 V,4ch. EMI_ESD Filter (100Ohm,15pF), Pb-free                     |       |        |
| 6     | L405         | INDUCTOR,CHIP         | ELCH0001401 | 15 nH,J ,1005 ,R/TP ,Pb Free  |       |        |
| 6     | LD200        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD201        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD202        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD203        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD204        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD205        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD206        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD207        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD208        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD209        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD210        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | LD211        | DIODE,LED,CHIP        | EDLH0004501 | BLUE ,1608 ,R/TP ,  |       |        |
| 6     | Q200         | TR,BJT,ARRAY          | EQBA0004902 | TES6 ,200 mW,R/TP ,NPN/PNP dual, Vo1=50V, Io1=100mA, Vo2=-50V,Io2=-100mA      |       |        |
| 6     | R200         | RES,CHIP,MAKER        | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP  |       |        |



| Level | Location No. | Description    | Part Number | Spec  | Color | Remark |
|-------|--------------|----------------|-------------|---|-------|--------|
| 6     | R205         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R206         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R207         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R208         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R209         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R210         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R211         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R212         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R213         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R214         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R215         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R216         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R217         | RES,CHIP,MAKER | ERHZ0000483 | 47 ohm,1/16W ,J ,1005 ,R/TP                         |       |        |
| 6     | R221         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R223         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R225         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R226         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R229         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R232         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R233         | RES,CHIP,MAKER | ERHZ0000326 | 330 ohm,1/16W ,F ,1005 ,R/TP                        |       |        |
| 6     | R237         | RES,CHIP,MAKER | ERHZ0000326 | 330 ohm,1/16W ,F ,1005 ,R/TP                        |       |        |
| 6     | R238         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R240         | RES,CHIP,MAKER | ERHZ0000505 | 680 ohm,1/16W ,J ,1005 ,R/TP                        |       |        |
| 6     | R241         | RES,CHIP,MAKER | ERHZ0000702 | 10 ohm,1/10W ,J ,1608 ,R/TP                         |       |        |
| 6     | SPFY00       | PCB,MAIN       | SPFY0154801 | FR-4 ,0.8 mm,BUILD-UP 6 ,GB10 MAIN PCB ,,,,,,,,,, , |       |        |
| 6     | U201         | IC             | EUSY0250001 | Leaded ,4 PIN,R/TP ,Hall IC                         |       |        |
| 6     | VA202        | VARISTOR       | SEVY0003901 | 5.5 V , ,SMD ,480pF, 1005                           |       |        |
| 6     | VA203        | VARISTOR       | SEVY0003901 | 5.5 V , ,SMD ,480pF, 1005                           |       |        |



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